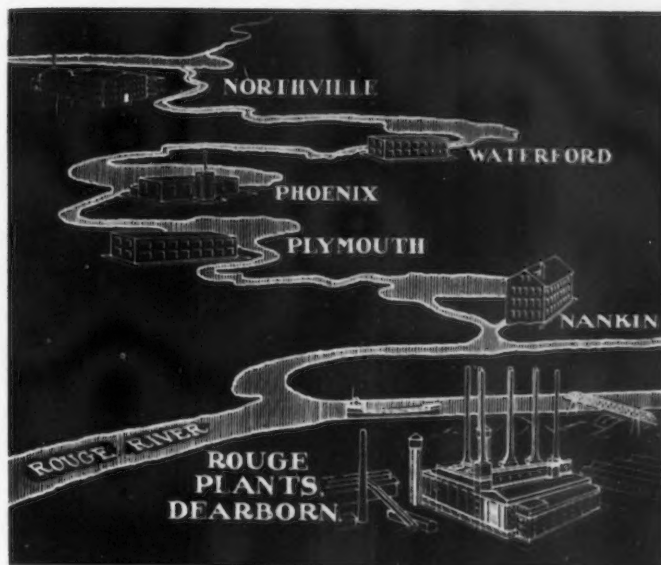


THE IRON AGE

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Dotting the banks of the River Rouge for 20 miles north of Dearborn are five of Ford's small plants. The Flat Rock and Ypsilanti factories, on other streams, do not appear on this map. Power for each plant is furnished by a hydro-electric unit.

Ford Champions the Small Plant

By BURNHAM FINNEY

Resident Editor,
The Iron Age, Detroit

THE intensity of the depression which has forced many of our large factories into temporary idleness or on to a ridiculously low operating scale has brought into sharp relief the economic dependence of a substantial portion of our population on the prosperity of a few highly concentrated industrial units. Nowhere has this been more apparent than in Detroit. In the automotive capital of the world the fortunes of several hundred thousand families rise or fall with the success or failure of half a dozen manufacturing plants. In the midst of a business famine, the families necessarily living in close proximity to the factories on which they lean for support are hard pressed to provide the bare essentials of food, clothing and shelter. When they have no income over a protracted period, they often are thrown upon the community.

Passing for a moment over the grim experiences of depression days, one may find many serious flaws in this economic structure even in good times. Pertinent questions rush to one's lips. Must employees be herded by the tens of thousands in a small area where intensive manufacture is conducted? Shall they permanently be denied the freedom and sunshine and the sense of well-being which come from living and working in less

crowded districts? Does our system of mass production mean that these people are condemned, without recourse, to the smothered outlook of our great cities?

Henry Ford, who is more responsible than anyone else for the develop-

HENRY FORD visualizes the breaking up of large industries into small plants scattered about the countryside. During the past decade he has established seven such plants within 20 miles of Dearborn, employing from 12 to several hundred workers and making Ford parts. They are forerunners of others in Mr. Ford's decentralization plan which eventually may scrap a considerable portion of the Rouge works. They give employees many advantages not to be found in large cities. They are a practical demonstration of Mr. Ford's theory that industry and agriculture must be more closely allied if the country is to prosper in the future and if every family is to attain economic security.

ment of mass production, answers these questions with an emphatic "No." He believes that industrial units should no longer be erected of such gigantic size that a social problem is created by the necessary concentration of masses of workers. He who had the vision of the Rouge plant at Dearborn, Mich., with its normal force of 100,000 men, now visualizes the breaking up of large industries into small plants scattered about the countryside.

Mr. Ford's plans already are beyond the theoretical stage. They were not born of the depression, but were conceived and first put into practice more than a decade ago. The publicity spotlight has been so focused on the giant plant at Dearborn that few people have known that within its shadow Mr. Ford is conducting an industrial and social experiment which promises to carry mass production a step further than it heretofore has gone. Dotting the banks of the River Rouge and other streams for 20 miles north and south of Dearborn are seven small industries which are his creations and which are a part of the Ford Motor Co. All of them have small overhead expense, are on the outskirts or within a few miles of a small village, are operated by water power, and employ



The rural setting of the Plymouth plant. The noise and confusion of the large city have been replaced by the quietude of the countryside.

from 12 to several hundred workers, many of whom live on farms.

Puts Theory into Practice

The evolution of these small plants is a practical application of Mr. Ford's theory that industry and agriculture must be more closely allied if the country is to prosper in the future and if a recurrence of the ravaging effects of the present depression is to be avoided. He recently voiced his thoughts in the following words, "With one foot on the land and another foot on industry, the country and every family in it are soundly based."

Workers in these small factories have many advantages. They can live within five to 15 minutes' drive of their place of employment. They can rent or own houses with a half acre, acre or larger plot of ground on which to raise part of their food supply. Their living quarters are sufficiently ample so that their children can play more safely and grow up in a healthier environment than in congested cities. If they so desire, they can occupy an entire farm, hiring whatever extra help is necessary to raise crops. They are not subjected to the nervous tension and the noise and confusion which are part of every large city. They can combine city wages with country living. As they are free to till land in the growing season, they have remained self-sustaining through these trying times. Their security is produced by machine and farm, not by one alone.

A Plant with 12 Workmen

Many of the small plants are engaged in metal-working activities. The smallest and quaintest is Nankin Mills, employing 12 men and making screw machine products. The building, which has been rehabilitated, was originally an old feed mill dating

back more than 100 years. It has 29 automatic screw machines working on parts for the generator, carburetor and the bearing post of the main drive shaft of the Ford car. A small hydroelectric plant generates current to operate the machines. One of the workmen farms four acres and another one acre. Across the road from the plant is a 60½-acre farm of Mr. Ford.

Built on an old mill site, the Plymouth plant employs 34 men making taps. The Waterford plant, on the River Rouge between Plymouth and Northville, has a force of 78 men manufacturing production gages. The Northville plant is a complete unit in itself. It builds valves for cars and trucks and employs 180 men. Just off a highway at the foot of a picturesque little lake outside Plymouth is the Phoenix plant, where about 70

women are employed making cut-outs for generators. For the most part the women come from small communities nearby. Head and tail lights are the products of the Flat Rock plant on the Huron River southwest of Dearborn. Employees number 400. The newest of the small plants is at Ypsilanti and makes electric ignition and starting parts. Its normal force is about 400 men.

These seven plants are but a beginning of the decentralization process which eventually may scrap a considerable portion of the Rouge works, the biggest manufacturing plant ever constructed in the United States. The plan calls for maintaining Rouge as the focal point for Ford production, with the motor and other vital parts still to be built here. However, hundreds of other parts will be made in small factories in rural communities and shipped to the nearest assembly plant, of which there are 32 in various parts of the country.

Today approximately 5300 companies outside the Ford organization are engaged in the manufacture of Ford materials and parts. Mr. Ford believes there should be 50,000; his policy is to work toward that goal. This will mean further decentralization.

Mr. Ford is an advocate of the theory that a plant becomes obsolete in seven years and that it is cheaper to erect a new one than to try to modernize an old one. He constructed his Highland Park factory in 1909 and began building the Rouge works in 1917, completely abandoning the former in 1920. Rouge has now gone far beyond the seven-year period. Carrying out Mr. Ford's ideas, the reconstruction process will take the form of new small plants rather than an elaboration of the existing structure at Dearborn.

One might well ask, "Is the foremost champion of mass production



In these small plants the worker is close to the soil. He can live within a few minutes' drive of his place of employment. He can rent or own a house with enough ground on which to raise part of his food supply. If he so desires, he can occupy an entire farm, hiring whatever extra help is necessary to raise crops.

proposing to abandon it, just as it has been perfected to the nth degree?" Not at all, answers Mr. Ford. His plan has consistently been to bring tools and materials to the worker instead of having him waste time and energy seeking them out. Hence the intensive development of the science of conveying materials to the worker, who scarcely moves out of his tracks to perform his daily tasks. It is this uninterrupted, swift flow of work into the hands of the worker that enables him to produce in such large quantities, to put manufacture on what is termed a mass production basis.

The breaking up of the large industry into small units carries the mass production idea a step further. Instead of the worker's driving or riding long distances to his job every day, his job is brought close to his home with approximately the same production processes used. Thus the change is not in technical manufacturing methods, but in factory location. The worker is closer to the soil while still laboring in the factory. He is able to raise food for his family while operating a machine.

Low Overhead and Cheap Power

With the decentralization of manufacture, production efficiency is being maintained on the same high plane which has prevailed heretofore. The most modern machine tools are employed in the small plants, conveyors are installed wherever practicable and every square foot of floor space is utilized in the best Ford manner. Products are shipped economically by truck either to the Rouge plant or to railroad freight stations nearby for trans-shipment to branch assembly plants. The products can be made as economically as at Rouge on account of low overhead and cheap power.

In his inaugural address President Roosevelt declared that we must recognize the overbalance of population in our industrial centers and, by engaging on a national scale in a redistribution, endeavor to provide a better use of the land for those best



Nankin Mills, which employs 12 men, is equipped with 29 automatic screw machines working on parts for the generator, carburetor and bearing post of the main drive shaft. The small hydroelectric unit (at the right) generates the necessary power. The rehabilitated building originally was an old feed mill.

fitted for the land. In the decentralization of his own gigantic company Mr. Ford is putting into practice what Mr. Roosevelt is preaching. The small plant program, in truth, is only part of a larger plan. Let Mr. Ford describe the larger plan in his own words:

Part of a Larger Plan

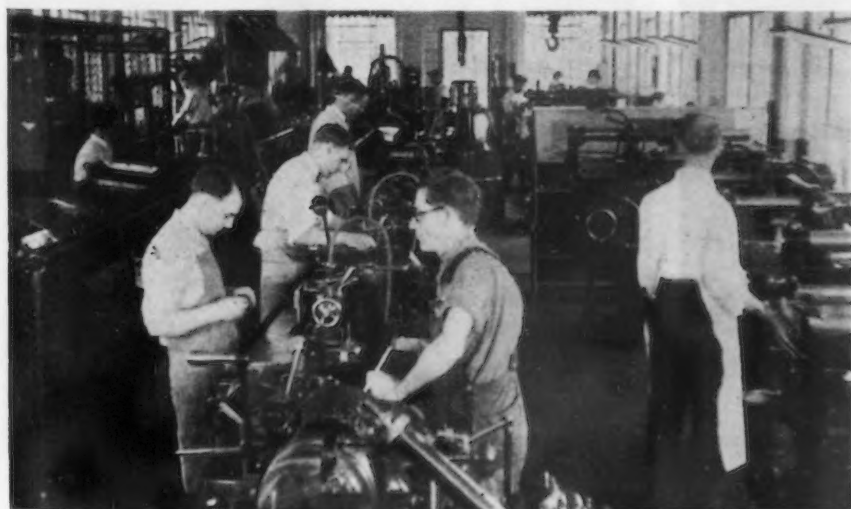
"For a long time I have believed that industry and agriculture are natural partners and that they should begin to recognize and practice their partnership. Each of them is suffering from ailments which the other can cure. Agriculture needs a wider and steadier market; industrial workers need more and steadier jobs. Can each be made to supply what the other needs? I think so. The link between is chemistry. In the vicinity of Dearborn we are farming 20,000 acres for everything from sunflowers to soy beans. We pass the crops through

our laboratory to learn how they may be used in the manufacture of motor cars and thus provide an industrial market for the farmer's products. I foresee the time when industry shall no longer denude the forests which require generations to mature, nor use up the mines which were ages in the making, but shall draw its raw material largely from the annual produce of the fields. The dinner table of the world is not a sufficient outlet for the farmer's products; there must be found a wider market if agriculture is to be all that it is competent of becoming. And where is that market to be found if not in industry?"

Synthetic Resin in Rods, Sheets and Tubes

A cast synthetic resin, Catalin, is furnished in solid form, such as in rods, tubes, sheets or special castings, by the American Catalin Corp., 230 Park Avenue, New York. It requires no seasoning, it is stated, and can be machined or worked like brass or hard wood. It is recommended for numerous industrial uses including handles, levers, fittings for machinery and gages. It is made in a variety of translucent, transparent, opal, solid, mottled, or grained color effects. It is said to hold its shape and color and to have high dielectric, tensile and compressive strength.

Coke shipments declined sharply in March reflecting the influence of the bank crisis upon general business activity. The total output of both by-product and beehive coke in March amounted to 1,759,335 net tons, or 57,199 tons per working day, a decrease in the daily rate of 7.8 per cent as compared with February.



The Plymouth plant employs 34 men making taps.

By ROGERS A. FISKE,
Western Editor, The Iron Age

Plastic Molding at the C

PLASTIC molding at the plant of Cutler-Hammer, Inc., Milwaukee, is of interest not alone because of the quality of the product but also because both the hot and the cold processes are used in the same department and presses are often used interchangeably on one process or the other as necessity dictates. Special arrangements and devices are used to feed the presses, and an innovation is the use of motor-driven, horizontal, single-stage air compressors to raise the pressure of steam which is needed in the hot molds.

Plastic materials that are molded cold consist essentially of asbestos fiber to which a binder is added. The molded part has little strength as it comes from the press, but it is then baked, or cured, after which it has a transverse strength of about 5000 lb. per sq. in. If a synthetic binder is used its strength may be increased to 7000 lb. per sq. in. Synthetic resins, those which are molded and

baked or cured in the mold, have transverse strength varying from 8000 to 10,000 lb. per sq. in. Another important consideration is the matter of the temperatures that the various finished products will withstand. Cold molded parts made with inorganic binder will withstand temperatures up to 1000 deg. F. If a synthetic organic binder is used the part can be used where the temperature does not exceed 400 deg., whereas with a natural organic binder the part can be used where temperatures reach 450 deg. Parts made from hot molded synthetic resin will withstand temperatures up to 350 deg.

Preparing the Material

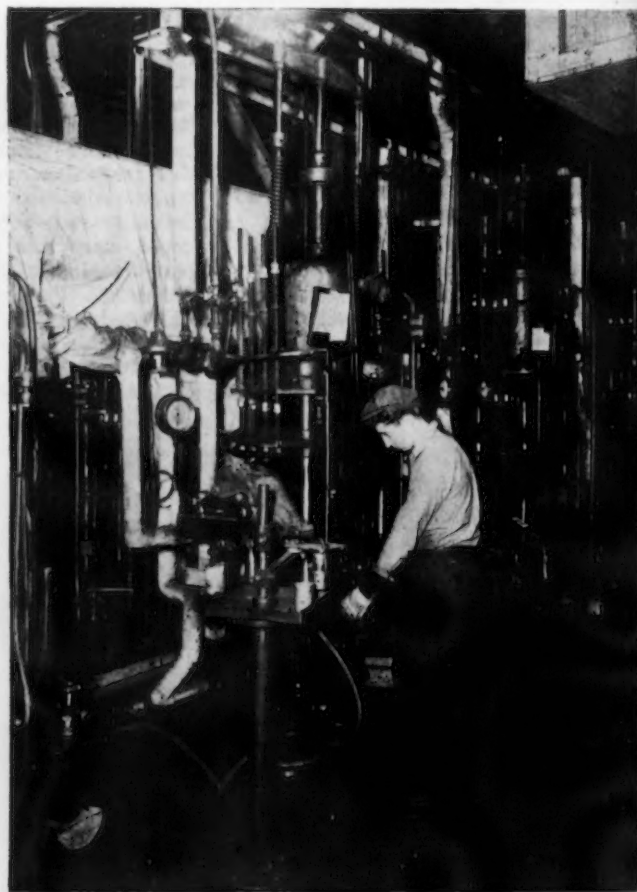
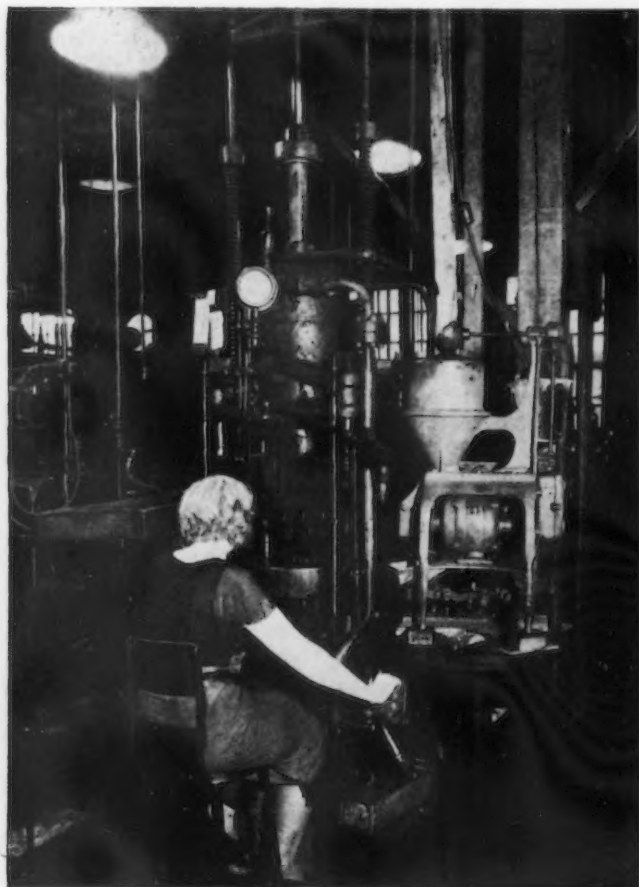
Synthetic resin molding materials are purchased in the open market ready for use. The material from which cold-pressed parts are made is prepared at the Cutler-Hammer plant. Its base is asbestos fiber, which is passed through a beater in order to

assure each batch being in uniform physical condition. This fiber is then passed on a belt over a magnetic pulley and dropped into a weighing hopper, which dumps into a mixer where the binder is slowly added.

The resultant mass, which is in lumps of various sizes, is elevated to a disintegrator consisting of two cages which rotate in opposite directions. The material is then unloaded by gravity to a reballing machine which is not unlike a concrete mixer. It is finally passed over three vibrating screens. The first two, or finest, sizes go to the stockroom and the third or coarsest size is sent back to the disintegrator for further reduction.

The stockroom is essentially a conditioning laboratory, where several rotating barrels are used to mix lubricant with the material. Here the grade for a specific job is selected and the requirements are weighed. Each pan is covered with a heavy wet cloth

THE automatic weighing device which stands at the right of the operator is extremely accurate. It is in operation during the time the press is functioning, saving operator's time.



THE measuring device at this press slides over a slotted plate, the molding material falling into a thimble. Note that the operator's left hand is engaged in a preparatory motion before the press can be closed.

at the Cutler-Hammer Plant

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to keep the material as conditioned. This cloth is kept on the pan at the machine, the operator taking a small quantity at a time to fill the feeder hopper.

All presses in this department are operated by oil pressure furnished by two accumulators. One accumulator furnishes oil pressure at 500 lb. per sq. in., which is used to close large presses through the non-working portion of the stroke. The other accumulator works at 4000 lb. pressure, which is used for that portion of the press stroke that compresses the material in the mold. Oil pressure is used because oil is easier than water on packings and there is no resultant corrosion. On the hot presses the low pressure is held until the material fluxes and then the high pressure is thrown on.

Most presses are interchangeable for either hot or cold work. However, those presses which are reserved for cold work are equipped with a special

free operating valve which permits bumping of the mold.

Material Is Measured Before It Is Molded

Premolding of slugs is not practicable in cold molding for the reason that this material does not flow easily. Hence the loose material is always used to fill the mold cavity. Many cold molded parts are complicated and the operator must quickly spread the material in the mold in a predetermined way to assure all parts of the mold being properly filled. In some cases, when the furnished part has many irregularities and blade-like projections, the operator uses a metal hook to press the material into the mold to assure its being properly filled.

Cold presses are fed either by automatic weighing, automatic volumetric measurement, or by measurement in a thimble, which is then dumped by hand into the mold. Because the

THE broadening use of plastic molded parts in industry has quickened interest in the manner that they are manufactured. In the accompanying article the author presents a detailed exposition of the methods used in the plastic molding department of a well known Milwaukee plant.

molds are cold there is no danger of curing the material in the feeding device. Consequently many of these devices are mounted to move on the mold plate.

For instance, some feed hoppers are made with a slot in the bottom. The hopper rests on the mold plate and automatically slides over the mold cavity between strokes of the press. The slot permits the material to fill the mold cavity.

An example of an automatic weighing device is afforded by a motor-driven screw feeding from a small hopper, all of which is mounted on a stand near a press. At the end of the screw housing is a gate actuated from the balance scales on which the weigh pan is placed. The operator is equipped with two pans so that one

(Concluded on Advertising Page 18)



THIS feeding device (the hopper can be seen back of the press) slides on the mold plate. It can be used only for cold molding. If its use were attempted for hot molding the material in the feeder would tend to cure from the heat of the mold plate.

This machine, which has a horizontal feed plate, grooves, broaches and cleans the tops of 1800 cold-molded pieces in an hour.



Electric Furnace Cast Iron in the Jobbing Foundry

DURING the last two years, we, in common with countless other foundries, have been confronted with a perplexing production problem—that of producing, with even a faint hope of profit, an extremely small tonnage of castings. By the installation, more than a year ago, of a rocking electric furnace, we not only have solved this problem, but also have developed a new line of business. High-strength castings made to specifications with precise control of quality, and rapid delivery of these castings, have become the keynote of our business.

In the average iron foundry, low tonnage production presents difficulties that affect both the foundryman and the customer. The cupola operator finds it necessary to hold patterns and defer deliveries until a sufficient tonnage of iron is in sight for economical operation. Even with the best regulated cupola, the first iron melted during the day is likely to be too cold for use, and usually is pigged. Thus, with cupola operation, a small tonnage melted results in an exorbitantly large percentage of waste metal, and obviously makes it economically impossible to melt several different types of iron as required by different castings.

By **W. B. CRAWFORD** and
R. B. CRAWFORD

President and vice-president, respectively,
Atlas Foundry Co., Detroit

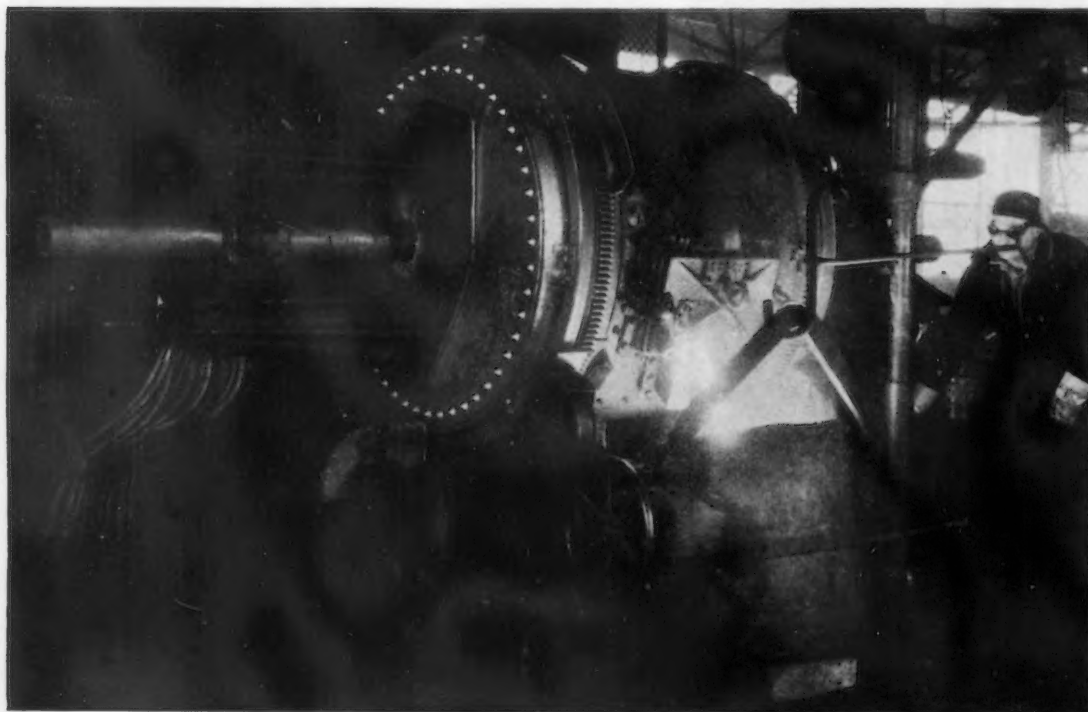
The installation of the electric furnace promptly eliminated these difficulties in our foundry. We were enabled to make prompt deliveries without the necessity of accumulating a suitable tonnage to melt. Furthermore, we were enabled to produce daily as many different types and compositions of iron as were required. Beyond this, we developed routine methods for the production of high-strength irons of a range of properties, and established laboratory control to assist in their production.

We also investigated the characteristics of our rocking type electric furnace and learned some of the unusual things that can be done with it. We found, among other things, that with this furnace we can control the composition and properties of the castings with arithmetical precision. Thus we have established procedure for the production of iron castings of greatly improved quality, which is under

highly accurate control at all times, and with delivery service, night and day, that is limited only by the time required to make the molds and cool the castings.

One of the illustrations shows our electric furnace installation. It is a rocking, indirect arc furnace, manufactured by the Detroit Electric Furnace Co., Detroit, and is rated at 1000 lb. capacity. In it we melt charges ranging from 200 lb. to 2000 lb., and we have melted charges of 2400 lb. on occasions. The furnace is adjacent to the cupola, so that we can economically duplex cupola iron whenever production tonnage is high enough. Duplexing charges usually range from 2000 lb. to 2500 lb. each, although we frequently duplex smaller charges.

We melt and superheat to 2950 deg. F. a 1000-lb. charge of cold iron in approximately 55 min., and duplex from 4000 to 6000 lb. per hr. depending upon the quantity of steel that is added to the molten cupola iron in the furnace. The unlimited flexibility of this arrangement is apparent and enables us to produce, with quality always under control, from 5 tons per day to 25 tons per day, depending upon the amount of duplexing that is done.



▲ ▲ ▲

IN the 1000-lb. electric furnace of the Atlas Foundry Co., Detroit, one day's production has represented 12 different compositions made from seven base heats. The furnace is placed near the cupola so that duplexing can be done when demand warrants.

▼ ▼ ▼

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A COMPELLING argument for using the small-tonnage rocking electric furnace in the jobbing foundry is furnished by the experience of the Atlas Foundry Co., Detroit, as here outlined by the president and vice-president of that company. When it is explained that a representative day's output covers irons of 12 different compositions, in both small and sizable castings, and aggregating altogether not so many tons, the economic importance of such a furnace, particularly at a time of meager business volume, is apparent. Emergency rushing of middle-of-the-night orders seems to be regarded as more or less routine. Duplexing with an adjacent cupola provides for larger output with any swelling in demand. On the technical side, the authors describe a series of tests to show the improvement in the product's properties obtained by rocking the furnace and increasing the temperature of the melt.

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The laboratory is in an adjacent room, and the metallurgist, who supervises making up the charges, has the carbon analysis of the iron within 15 min. and the silicon analysis within 45 min. from the time the iron is poured. We have learned from experience that when a certain procedure is followed in this furnace for a given composition of iron, the physical properties of the castings are invariably of predetermined values. Therefore, by combining the analyses with Brinell hardness readings, also made in the laboratory, we have an absolute check on every casting before it is shipped.

Investigate Rocking and Superheating the Melt

To illustrate the improvement that this electric furnace makes in the quality of cast iron, we have run a series of tests, the results of which

are summarized in an accompanying table, together with corresponding photomicrographs. The following procedure was used to determine the benefits of rocking as compared with

stationary melting, and to introduce also the benefits of superheating:

- (1) 500 lb. of ordinary scrap iron were charged into the furnace.
- (2) With the furnace remaining absolutely stationary, this charge was melted and heated to 2600 deg. F., an average cupola pouring temperature.
- (3) Four arbitration test bars (1.25 in.) and castings for machinability test were poured.
- (4) With the furnace still remaining stationary the iron was heated to 2800 deg., hotter than most cupola iron and equivalent to the pouring temperature of many stationary electric furnaces.
- (5) Four arbitration bars and castings for machinability test were poured.
- (6) Holding the temperature constant at 2800 deg., the furnace was rocked for 10 min.
- (7) Four arbitration bars and castings for machinability test were poured.
- (8) Rocking the furnace constantly, through an angle of 200 deg., the re-

TESTS SHOW PROPERTIES OF ELECTRIC FURNACE IRON WERE IMPROVED BY ROCKING THE FURNACE AND INCREASING THE TEMPERATURE

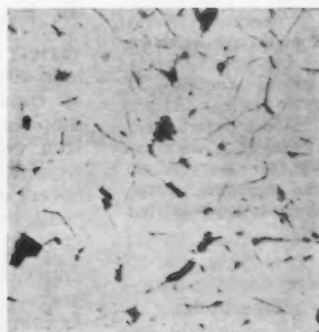
	Furnace Stationary Temperature, 2600 Deg. F.	Furnace Stationary Temperature, 2800 Deg. F.	Furnace Rocked 10 Min. Temperature, 2800 Deg. F.	Furnace Rocking Temperature, 3000 Deg. F.
Transverse strength, lb.....	4,040	4,045	4,310	4,540
Deflection, in.....	0.221	0.225	0.241	0.249
Tensile strength, lb. per sq. in.....	31,900	32,700	34,500	35,600
Brinell No., center.....	168	180	182	189
Brinell No., edge.....	187	188	185	189
Total carbon, per cent.....	3.40	3.39	3.43	3.42
Silicon, per cent.....	1.65	1.67	1.65	1.67
Sulphur, per cent.....	0.09	0.09	0.09	0.09
Phosphorus, per cent.....	0.25	0.25	0.25	0.25
Manganese, per cent.....	0.58	0.57	0.58	0.57
Nickel, per cent.....	Trace	Trace	Trace	Trace
Chromium, per cent.....	Trace	Trace	Trace	Trace
Molybdenum, per cent.....	Nil	Nil	Nil	Nil
Relative machining ease.....	4	3	2	1

Furnace Stationary Temperature, 2600 deg. F.



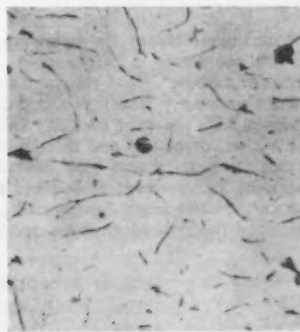
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Furnace Stationary Temperature, 2800 deg. F.



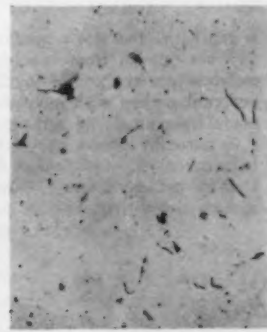
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Furnace Rocked 10 min. Temperature, 2800 deg. F.



x 100 Unetched

Furnace Rocking Temperature, 3000 deg. F.



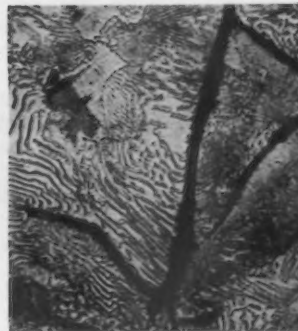
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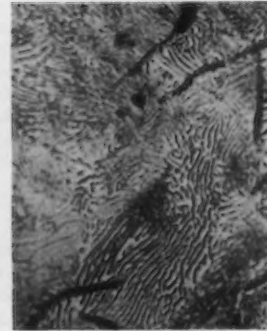
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- maining iron was then heated to 3000 deg.
- (9) Four arbitration bars and castings for machinability test were poured.

The chemical, physical and machining tests and the photomicrographs were made by the Delray Research Laboratories and the Detroit Testing Laboratory, and conclusions drawn from the data are as follows:

- (1) Increasing the temperature of the iron from 2600 deg. F. to 2800 deg. F., with the furnace stationary, produced only slight improvement in the physical properties and machinability. As shown by the photomicrographs, there has been some refinement of structure, which has resulted in making the interior of the castings denser.

ture has been improved still more and the hardness is now exactly the same in the center as at the edge. This condition gives maximum machinability, and the test showed that deeper cuts could be taken from these castings than from any of the previous series.

The iron used in this test is not of a composition to produce maximum strength. The properties of this iron, as shown under series No. 4, are excellent and give it many applications, but we regularly produce much stronger irons both with and without alloys as required.

Twelve Irons from Seven Base Heats

A photograph, here reproduced, shows a diversified group of castings

We find this procedure to be economical and accurate. The rocking action of our electric furnace quickly stirs the additions into solution and mixes the metal to complete uniformity. The accuracy of control that we obtain with this furnace manifests itself in another manner. As will be noted from the table with the photomicrographs, the composition of the iron has remained constant throughout the test. This is characteristic of the melting practice, and, as a result, we are able to reproduce, with precision, any desired composition within the limits of sampling and analytical error. The following data are for a heat of automobile cylinder iron, and compare the composition specified to us by the customer with the customer's analysis of the castings received.

AUTOMOBILE CYLINDER IRON

	Customer's Speci- fication	Cus- tomer's Analysis
Total carbon, per cent	3.00	3.01
Silicon, per cent....	2.00	1.99
Sulphur, per cent....	0.08	0.07
Phosphorus, per cent.	0.15	0.14
Manganese, per cent.	0.60	0.59
Nickel, per cent....	1.50	1.49
Chromium, per cent..	0.40	0.42
Molybdenum, per cent	0.60	0.61

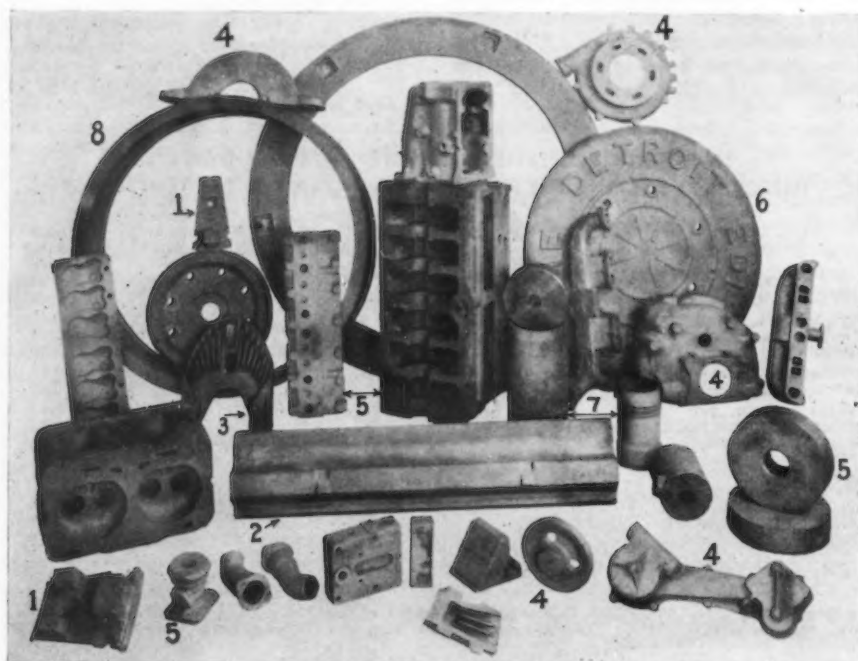
As a result of improved quality, we supply castings for many interesting applications. For example, certain jigs used in automobile body plants, formerly were made of steel castings. Cupola iron did not possess sufficient strength nor shock resistance. We now produce large quantities of them from our electric furnace iron. Among other things, the specification calls for minimum tensile strength of 40,000 lb. per sq. in. The castings delivered exceed 45,000 lb. per sq. in. These castings are cheaper than steel, wear better, and machine much more easily.

In the illustration of the day's variety of castings appears a man-hole cover. This formerly was made of cupola iron and weighed 225 lb. Application of a special high-strength iron made it possible to reduce the weight to 160 lb. Moreover, the new covers are stronger and do not crack, bend, or warp in service.

Another interesting example is a "lap" used in the manufacture of gears. Cupola iron of various types had long been used with indifferent success. Some gave fair results and some were poor. They finished from 25 to 50 gears each. The electric iron "laps" that we now supply finish 500 or more gears each, and the quality is always the same.

Some Notable Quick Deliveries

As previously stated, our delivery promises are limited only by the time required to prepare the molds and cool the castings below the danger point. Castings frequently are delivered when they are still too hot to handle comfortably. For example—a pattern for an experimental automotive casting was received at 4 (Concluded on Advertising Page 20)



A representative day's production of castings includes the following: Coal pulverizer hammers (1) are poured from special alloy iron containing 3.75 per cent carbon. Die iron (2) is a molybdenum iron containing 2.65 per cent carbon. Heat resistant stoker parts (3) contain 2.90 per cent carbon with molybdenum and chromium. Housings and ordinary small castings (4) are made from unalloyed soft iron containing 3.50 per cent carbon. Cylinders (5) are poured from 3.10 per cent carbon iron, containing nickel, chromium and molybdenum as required. The man-hole cover (6) was poured from a special heat-treated iron containing 2.15 per cent carbon. Iron for cylinder liners (7) usually contains 3.25 per cent carbon and nickel and chromium. Large marine piston rings (8) are poured from the same iron. Silicon and other elements are regulated in each case to produce the desired strength and hardness.

- (2) Rocking the furnace for 10 min. while holding the metal temperature constant at 2800 deg. increased the transverse strength 6.68 per cent and the tensile strength 8.15 per cent over the original 2600-deg. iron, melted with the furnace stationary. The photomicrographs show structural improvement, with the graphite in finer particles and more uniformly distributed than before. This is further demonstrated by the increased hardness of the center of the castings, showing that the structure is more nearly uniform from edge to center. The machinability was also improved.
- (3) Heating the iron to 3000 deg., while rocking constantly, gave increases in transverse and tensile strength of 12.37 per cent and 11.60 per cent respectively as compared to the original 2600-deg. iron. The struc-

ture has been improved still more and the hardness is now exactly the same in the center as at the edge. This condition gives maximum machinability, and the test showed that deeper cuts could be taken from these castings than from any of the previous series.

that is a representative day's production. These castings range in weight from less than 1 lb. to over 400 lb. The castings also represent 12 different compositions of iron that were made from seven different base heats. Frequently two or more types of castings require the same carbon content but require a different silicon content. At other times, two castings may each require the same carbon and silicon content but one may require alloys. In these cases, unalloyed iron of the proper carbon content is melted first, with the silicon correct for the casting requiring the lower silicon. The castings requiring this metal are poured and then the silicon is increased or alloys added, or both, and the remaining castings poured.

... LETTERS TO THE EDITOR ...

"Yes, We Have No Bananas"

Editor, *The Iron Age*:

C. E. Carpenter of Paris, France, whose letter was published in your issue of April 6, certainly expresses a deep dislike of Europe, which makes one question why he stays there. I repeat what he says, for it indicates an astonishing twist of the mind—"Meanwhile, you can be assured that Europe will continue to bewilder you until she gets everything away from you that her deceit and rapacity covet."

I wonder if Mr. Carpenter knows what export trade means, and if he knows that Europe is our best customer? Our balance of trade with Europe averages about three to one in our favor. The only exception is Russia, and outside of Europe, Brazil, through our large imports of coffee, seems to be the only other exception. So, among all nations, we seem to be the favored one, even today.

Our exports three years ago were over \$5,000,000,000. Last year this dwindled down to less than \$2,000,000,000 but with balances, though reduced, still in our favor. This indicates that our customers are afflicted with the same business paralysis from which we are suffering.

We hear a great deal these days about buying American. It sounds very fine, but what will be the ultimate results if carried to the point of noticeably decreasing our purchases abroad? We have most of the trade balances in our favor; the other fellows will not fail to counter by every means in their power.

We are not the self-contained nation that some of our 100 per cent Americans please themselves to believe. We are dependent on the outside world for many of the basic materials that feed our industries and ourselves. To mention a few of the long list: manganese, nickel, tin, platinum, asbestos, rubber, silk; and other things we consume so generously—coffee, tea, and "yes, we have no bananas." Of course, I could continue and mention such articles as shellac, camphor, etc., etc. A child in the primary grades can figure, in a moment, how long we could buy these necessary materials without export balance. Our gold reserve would soon vanish.

We are entirely too free with our acrimonious criticism of our neighbors, based seemingly, in most cases, on blind, personal prejudice. No possible good can come from it, and certainly, in many cases, it is extremely harmful.

We want to live and Europe wants

to live, and we should try to promote the cheerful policy of "Live and Let Live."

The flow of international trade is the life of the nation and promotes good will. At no time in our history have we needed more than we do now—good will and trade.

GEO. P. THOMAS,
President, *Thomas Spacing
Machine Co.*

Pittsburgh.

A Voice from Abroad on the Debt Problem

Editor, *The Iron Age*:

The time is not far off when people have got to lay aside their fears and their doubts and to face the facts. The facts are that as a result of the war the United States started on a journey for which it was ill-equipped. From being an isolated people, immersed since our beginning in the development of the United States, we became an active political factor in world affairs. It is not strange that we have not been successful in a game in which the cards were stacked against us in advance. Today, we are bearing all the marks of our unwise adventure. It is to be hoped that the lesson will sink in and that if we can save something out of the wreck we will do so.

As a matter of fact, we have no one to blame for our misfortune but ourselves. The American newspapers published over here have since the war painted such lurid pictures of our rum-running, racketeering and divorce activities that Europeans have begun to look upon us as a mentally-deficient, rum-soaked nation, more fit to be bled than to be respected. In addition, Americans have squandered so much money in so-called charitable enterprises in Europe, in the hope largely of winning coveted decorations and other official recognition, that Europeans have acquired the habit of looking upon us as inexhaustible moneybags, whose "Open, Sesame" is a bit of ribbon worth about six cents a yard. They, therefore, will not pay for anything that they can possibly get out of us.

After the war, when we started out on our new job as the credit reservoir of the world, the only way our bankers could conceive of their new role was to send out emissaries to Germany, South America, etc., to find out how much money those countries were willing to borrow from us. In order to make the 5 or 10 per cent commission, they literally forced their money on foreign countries, taking in exchange bonds and notes which, through their high-powered bond

salesmen, they unloaded on the gullible American public. To the lasting credit of the foreign borrowers, it must be admitted that they could have "got into us" a great deal deeper had there not been a limit even to their appetites. Now the bankers who were most active in getting rid of American money to foreign borrowers have the effrontery to insist that in the interests of world recovery the United States Government must cancel the foreign governments' debts. They are willing that everything should be canceled except the money that is owing them.

There is only one thing that can put an end to the present situation and that is an aroused public opinion. If there is one thing that politicians, bankers and other parasites fear, it is public opinion. Public opinion is waiting to be informed and when this is accomplished the people will regain their confidence. The American people are beginning to see Europe in its true light, but the propaganda Europe has diffused in the United States has been so painstaking and the skulls of our political leaders have been so thick that only a start has been made.

Europe can easily pay her so-called war debts to the United States. It would be an exceedingly dangerous thing for the United States to cancel or greatly reduce them at this time, as it is certain that the day will come when Americans will be glad to have this asset. Europeans know they must act quickly while the depression in the United States is at its height, and this is the reason for the never-ending insistence of the British and the French that cancellation will bring about world-recovery. It is a chant that can be broken up by the most casual student of business and finance, if he will start from the standpoint of what has really happened in the world since the war.

C. E. CARPENTER.

Paris, France

Household washing machine factory sales increased 24 per cent in February over January and 82 per cent in January over December, according to statistics compiled by the American Washing Machine Manufacturers' Association. Shipments totaled 50,518 washers in February, 40,644 in January and 22,272 in December, by manufacturers representing 90 per cent of the industry's production.

A steam generating unit for the small plant, built in a range of sizes for capacities of 8000 to 40,000 lb. of steam an hour, is announced by the Combustion Engineering Corp., 200 Madison Avenue, New York. It has a low head room and small floor space requirements, and the top and front have water-cooled tubes connecting into the boiler drum.

Reducing Cooling Costs In By

COOLING coils—wash oil, ammonia liquor, benzol, etc.—in by-product coke plants have since the inception of the industry been chronic “sore thumbs.” It is impossible to estimate the annual loss to the industry which is the result of unsatisfactory cooling equipment. It is only necessary, however, to mention the high rate of replacements, the high cost of cleaning, or the large wastage of water with the conventional pipe coils to establish the fact that the cost of maintenance is excessive.

For some unknown reason, until recently, no one has seen fit to incorporate radical changes in the fundamental design of this equipment. In the writer's opinion this neglect has been largely due to the uninterrupted prosperity that made it possible for the executives of coke plants to sanction the continual expenditures necessary for the maintenance of their steel pipe cooling coils. During the last three years, however, every source of expense, in the coke industry as in all others, has been subject to the scrutiny of those in charge of “paring” costs. As a result of this scrutiny, a large amount of effort has been directed during the last two years toward the development of less costly cooling equipment.

In following this development, it has been found in the majority of the coke plants wherein experiments are being conducted on cooling equipment that the research has been confined entirely to the substitution of different materials for the conventional steel or galvanized steel pipes. Alloyed steels, cast iron, alloyed cast irons, even glass tubes, have been subjected

¹Complete data published in Report CP-10, National Radiator Corp., Johnstown, Pa.

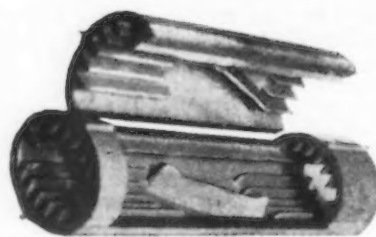


Fig. 1—Cutaway view of cast iron section showing interior ribs and swirler fins

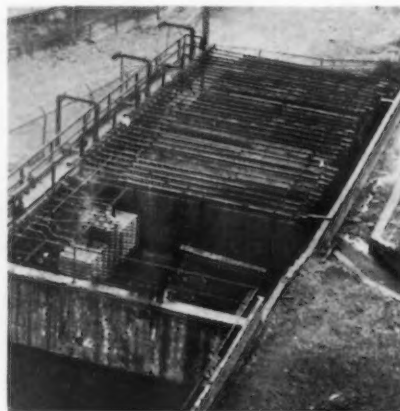


Fig. 2—The bank of cast iron sections in the foreground has replaced conventional pipe coils which formerly occupied the whole end of this pit. This is a wash oil cooling installation

to tests in these investigations to find a means of reducing cooling costs. Excepting several rather disastrous attempts to utilize shell and tube coolers, the writer knows of but one notable case where changes in actual design were effected. In view of the economies afforded by this particular change in design, it is thought that the industry would be benefited by a brief summary and description.

It is necessary that those factors which affect the ultimate cost of coke plant cooling apparatus be listed in order that intelligent thought be given this question. These factors are presented in the accompanying table with percentage figures showing the relative costs of cooling wash oil by conventional pipe coils and by this newly designed equipment. These relative costs are based on the results of tests¹ conducted in a modern by-product coke plant under actual operating conditions.

The significant facts which stand out are:

1. The appreciable savings in first cost.
2. A remarkable reduction in space occupied.
3. A considerable decrease in quantity of cooling water and consequently in power required to pump it.
4. Cleaning costs approximately cut in half.
5. Minor repairs practically eliminated.
6. No need for more vigilant supervision.
7. Increase of length of replacement cycle to about 10 years under conditions where steel pipe lasts three years.

The conventional steel pipe cooling coils with water applied from “saw tooth” troughs are so universally used in the industry that no time need be devoted to further description here. It will be well, however, to briefly state the conditions which handicap this old type of equipment in the performance of its duties. At the same time it will be pointed out how the new type of cooling unit has overcome these handicaps.

Heat Transfer

Those conditions usually prevalent in by-product coke plants which impede the rate of heat transfer in steel pipe coolers are:

1. Velocities of flow of liquids inside pipes not sufficient to create turbulence necessary for high rates of heat transfer.
2. Solid matter carried by liquid being cooled deposits on inside of pipes in form of insulative sludge.
3. Corrosive nature of average cooling water causes layer of rust to insulate the outside of pipes.
4. Solid matter content of cooling water often precipitates on outside of pipes as insulative scale.

Two simple expedients—internal ribbing and the substitution of cast iron for steel—have served to improve these conditions to such an extent that, under typical operating methods, rates of heat transfer have been increased approximately 100 per cent with no increase in pressure drop.

The application of internal ribs and swirler fins creates a “synthetic” turbulence and hence greater heat transfer without resorting to increased velocity and its attendant higher pumping costs; second, the scrubbing

COMPARISON OF INSTALLATION, OPERATING AND REPLACEMENT COSTS Wash Oil Cooling Costs

Items of Expense	Relative Costs	
	Two. In. Steel Pipe Coils, Per Cent	New Type Sections, Per Cent
Installation costs		
Space required.....	100	19
Foundation and support piers.....	100	19
Cooling equipment—material.....	100	81
Cooling equipment—erection labor.....	100	31
Operating Costs		
Pumping oil.....	100	100
Water	100	87
Pumping water.....	100	87
Cleaning	100	54
Minor repairs.....	100	5
Supervision	100	100
10-Year Replacement Costs		
Material	100	8
Labor	100	3
Losses through shut-downs.....	100	2

By-Product Coke Plants

By B. T. DU PONT
National Radiator Corpn.

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action of the swirling fluids practically eliminates the deposit of sludge on the inside; and third, the heat absorbing surface of the interior is made larger than the heat dissipating surface of the exterior so that it is assured that the amount of heat which the cooling water carries away is not being limited by the fact that a smaller internal surface is "choking" the amount of heat which can be supplied to the external surface.

In contrast with the layers of rust which build up and form an insulative coating when steel corrodes, the granular structure of cast iron is such that as corrosion occurs the erosive action of the cooling water is sufficient to continually wash away the corroded "grains" provided the design of the exterior offers no ridges or crevices for the accumulation of this rust. In the same manner, of course, any products of corrosion due to internal corrosive agents are carried away. Consequently both inside and out a cast iron cooling coil, over a period of time during which it is subject to mild or severe corrosion, will offer less resistance to heat transfer than will a similarly designed steel coil.

The precipitation of solids from the cooling water on to the coils is a very prevalent cause of impaired rates of heat transfer. Excepting some form of independent equipment for removing these solids from the water before it is applied to the coils, there is at present no practical means of preventing the formation and building

A DEPARTURE in cooling practice through the use of cast iron, internally finned sections has produced remarkable results under test in by-product cooling coils. In addition to other operating economies there is a marked reduction in space required.

up of deposited insulative scale. Therefore, that equipment which is most cheaply cleaned of this "inevitable" scale is that which will maintain the cheapest rate of heat transfer—which is the goal of all such apparatus. Assuming that cleaning must be done, there are two means of reducing the cost:

1. Improve the accessibility of the surfaces to be cleaned so that the labor per unit of surface is reduced.
2. Decrease the number of units of surface to be cleaned so that the total labor cost will be reduced, even though the unit cost be the same or greater.

No data are available to show actual comparative cleaning costs. Therefore, it is impossible to prove conclusively whether steel pipe coils or internally ribbed sections will permit the lower "unit of surface cleaned" cost. Judging from appearance only, it would seem that accessibility is about equal in each case, with a slight advantage perhaps resting with the pipe coils if a very thorough scraping were necessary. The unit cost, however, is important only inasmuch as it affects total cost, and it

has been found as the result of actual operating performances cooling wash oil that only about 50 per cent of the external surface required using 2-in. steel pipe will suffice for internally ribbed sections. The savings in cleaning costs effected by the use of internally ribbed sections is therefore apparent.

Water Consumption

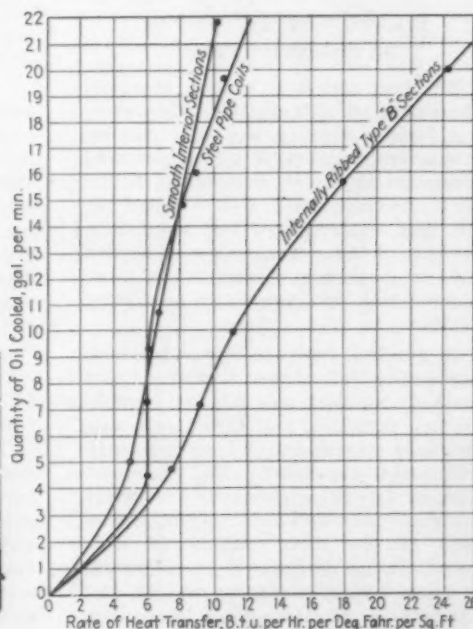
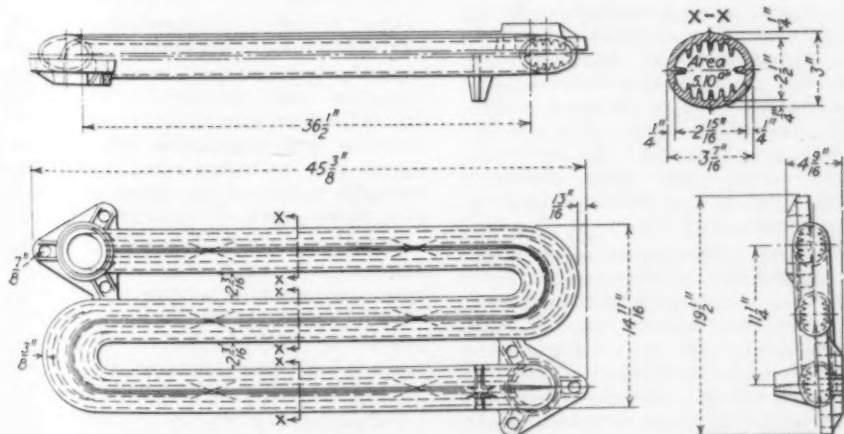
Due to the fact that most coke plants are able to use relatively cheap water this item is not as large as it might be. Even so, however, the cost of water and pumping it are two of the major cooling coil operating charges. In the majority of cases the wastage of water with pipe coils is enormous. In order to obtain the desired temperature drop, it is found that excess water must be applied regardless of the waste. The design of pipe coils is necessarily such that when more than a certain amount of water is applied, splashing develops. Such water, falling between the coils, absorbs no heat and hence the coke plant actually pays for pumping it to the sewer without deriving any benefit whatsoever.

The construction of the internally ribbed section effectively solves the problem of wastage by splashing without materially reducing accessibility. By the adoption of an S-shaped section it has been possible to "compress" length of coil into width in such a way that the decreased length permits practically the same

(Concluded on Advertising Page 22)

Fig 4 (at right)—Variation of rate of heat transfer in steel pipe coils, smooth interior cast iron sections and internally ribbed cast sections.

Fig. 3 (below)—Elevations and section of an internally ribbed coil unit.



Welding Society Holds Annual Meeting

DISCUSSION of tentative specifications for welding and gas cutting in machinery construction, a comprehensive lecture on the application of welding to structural steel work, and the acceptance of the recently completed welding wire or filler metal specifications were features of the fourteenth annual meeting of the American Welding Society, held at the Governor Clinton Hotel, New York, April 27-28. As heretofore, the convention was followed by a meeting of the American Welding Bureau, the research division of the society.

Election of officers resulted in the renaming of F. P. McKibben, consulting engineer, Black Gap, Pa., president, and the election of J. J. Crowe, engineer, Air Reduction Sales Co., Jersey City, N. J., as senior vice-president. C. A. McCune, consulting engineer, New York, and Miss M. M. Kelly continue as treasurer and secretary, respectively.

New divisional vice-presidents are: G. Raymond, American Tank & Equipment Co., Oklahoma City, Okla., Southern division, and D. J. Williams, Air Reduction Sales Co., San Francisco, Pacific division. New directors are A. Vogel, General Electric Co.; W. H. Gibb, Thomson-Gibb Electric Welding Co.; H. S. Smith, Prest-O-Lite Co.; J. C. Lincoln, Lincoln Electric Co.; and W. C. Swift, American Brass Co.

The business session also included awarding the Samuel Wylie Miller Memorial Medal to H. H. Moss, engineer, Linde Air Products Co., New York, for his achievements in fusion welding and flame cutting.

Presents Code for Welding of Machinery Parts

The first technical session featured discussion of a tentative code covering fusion welding and gas cutting in machinery construction, which was presented by G. D. Spackman, president, Lukens Steel Co., Coatesville, Pa., and chairman of the committee. Because of the increased use of welded steel in machinery construction, these design data are regarded as highly useful.

In general, the code refers to steels containing less than 0.30 per cent carbon. Sections are devoted to definitions, material, and stress relieving and heat treatment. Three classes of weld metal are listed. The main section covers permissible unit stresses for static and dynamic loading, using each of the three classes of weld metal. In the discussion, stress values of Class 3 were held to be too low, and elimination of this class was suggested. Gas cutting, qualification of

welders and general requirements for workmanship are covered in other sections of the specifications.

A number of illustrations will be included with the code when printed. These include photomicrographs, photoelastic studies of stress distribution, and illustrations of various types of welded machinery members, including combinations of structural steel and castings.

A revised draft of the tentative code for fusion welding of pressure piping was presented at the same session by T. W. Greene, Linde Air Products Co. This code is a section of section 8, devoted to fabrication details, of the code for pressure piping, which is sponsored by the American Society of Mechanical Engineers, American Welding Society and other organizations and is being prepared under A.S.A. procedure. It includes preparations for making and testing welded joints and testing of welders, and in the main covers circumferentially welded joints where the stresses are low. The revised code is being transmitted to the A.S.A. with some changes suggested at the open meeting.

Structural Welding Making Progress

A lecture on "Erecting Steel Buildings and Strengthening Steel Bridges by Welding," by Prof. F. P. McKibben, president of the Society, was an outstanding feature of the convention. More than 125 municipalities have incorporated in their building codes permission to use welding in steel building frames, he said. The importance of theory, the stresses in riveted and side welded joints, and typical connections, such as beams to beams, column splices, and beams to column connections, were discussed.

In describing methods of repairing metallic bridges, it was stated that as existing highway bridges are replaced or extensively repaired, the wooden plank floors are being replaced by steel or concrete. Comparative loading tests of welded, riveted and bolted floor panels made of channels were discussed. In a series of tests to compare the behavior of Belmont rolled steel interlocking floors, alike except for use respectively of bolts, rivets or welds to connect the various channels together, the welded floor was said to show greater stiffness.

Tendency to require too many tests was emphasized in discussing structural steel qualification tests for welders. "It goes without saying that welds must be safe; that welding contractors should show their ability to supervise, and their welding operators to perform the work satisfactorily," said Prof. McKibben. "But there is

a tendency to require too many tests. Too much emphasis has been placed on qualification tests. Constant reference to tests engenders a feeling of fear regarding the safety of welding processes. Fear comes from inexperience, from ignorance. Welding is as safe as are any of the other processes of the industrial arts."

Steel Homes an Outlet for Steel

In steel homes, the lecturer said, "a fertile field lies fallow, uncultivated. It should be tilled with the same thoroughness as that already exerted by steel companies in other endeavors, notably in multi-story buildings and bridges, and by electrical and gas companies in expanding the markets for welding and flame cutting of steels.

"Assuming a need of 10 tons of steel in channels, beams, angles and bars to form the framework to support walls, floors, partitions and roofs in each of 200,000 homes, a potential annual market of 2,000,000 tons of steel is awaiting development.

"But to bring this to fruition is no small task, because it involves considerable effort in educating architects to recommend, builders to supervise and artisans to construct," said Prof. McKibben.

Discussion centered for the most part on qualification tests for welders and on the resistance welding of structural steel. Although development of resistance welders for structural shop work involved overcoming many difficulties, it was held that there is a great opportunity along this line. Resistance welders that will handle two thicknesses of 1/2-in. plate are now available, it was pointed out.

At the opening session, April 28, Charles F. Abbott, executive director, American Institute of Steel Construction, New York, addressed the convention on "Must Industry Be a Pawn or a Power?"

Only through cooperation on the part of individual companies can an industry protect itself against disintegration and depression, he said. Mr. Abbott pointed out that those industries best organized into associations and institutes have more successfully withstood the ravages of the past three years of depression.

"The measure of a successful trade association," said Mr. Abbott, "is whether the public benefits. When the benefits are mutual, reverting to the public as well as to the industry, then indeed does industry become a power; otherwise it is a pawn."

"Welding as a Factor in Industrial Revival" was discussed by W. T.

Chevalier, *Engineering News Record and Construction Methods*, at the same session.

Welding Wire Specifications Based on Performance

Election of officers, reports of committees, including progress reports by research workers under the direction of the fundamental research committee, and addresses on tests of welds comprised the meeting of the American Bureau of Welding.

All officers were reelected. They are: Dr. C. A. Adams, professor of engineering, Harvard Engineering School, president; H. M. Hobart, consulting engineer, General Electric Co., and J. H. Critchett, head of research, Union Carbide & Carbon Corp., vice-directors, and W. Spraragen, secretary.

The welding wire specifications committee has completed its filler metal specifications for low and medium carbon steels and plans to issue them in printed form within the next 30 days. These specifications are based on performance, rather than on chemical composition as previously. Four grades of filler metal, based on quality of weld, are specified. The first three cover boiler plate and fire box steel and the fourth covers structural material. Full details are given as to how to prepare test specimens. These specifications, it was stated, have been scrutinized by everybody concerned with the subject, including the American Society for Testing Materials, which plans to adopt them as a tentative specification. The work of the committee, which is headed by C. A. McCune, was highly commended.

The structural steel committee, headed by L. S. Moisseiff, consulting engineer, New York, is working out a simplified program of tests, and is also determining the effect of flame cutting of certain kinds of steel in bridge work that is now being done. Tests of beam connections of various kinds are being made, and data on impact resistance of welded joints are being examined. With the publication of its comprehensive report, the welded rail joint committee has completed its work.

In reporting for the fundamental research committee, H. M. Hobart pointed out that about 40 university professors in all parts of the country have been enlisted for this work, and 30 of them are actively engaged in fundamental welding researches at this time. Some 60 projects are listed; they include corrosion fatigue of welded joints; bend tests; photoelastic studies of structural joints; study of residual stresses from heat of welding; influence of surface defects on gas cutting; X-ray and gamma ray examination; nitrogen in welds; electrode coating and grain refinement; and effects of peening on weld quality.

Progress reports were submitted by

several university research workers, including undergraduate students. A feature of the meeting was an address on "Evaluation of Visual and X-ray Tests of Welds," by Dr. H. H. Lester, metallurgist, Watertown Arsenal, Watertown, Mass. At the arsenal a variety of test methods are used: physical tests of test specimens, metallographic surveys, and fracture tests; the latter said to be one of the most practical as well as the most simple of tests. Non-destructive tests include visual examination, from which a great deal may be learned as to weld quality.

Radiographic examinations are used for procedure studies, to instruct the welder, to qualify the welders, for production control, to establish and maintain definite standards of quality; and for final inspection of the welding. The X-ray picture gives a permanent record and thus permits tracing causes of service failure if necessary. Gamma ray equipment was also discussed.

Dr. Lester illustrated his talk with several interesting lantern slides, from which he discussed the nature and effect of porosity, imperfect penetration, poor fusion and undercutting.

Economic Subjects To Be Featured at Meeting of Steel Institute

THE spring meeting of the American Iron and Steel Institute will be held at the Hotel Commodore, New York, on Thursday, May 25. This will be the first since the appointment as president of the institute of Robert P. Lamont, who was Secretary of Commerce in the Hoover Cabinet. The usual fall meeting of last year was cancelled.

An innovation of this May meeting will be the devotion of the entire morning session to a discussion of the economic problems of the steel industry. The technical papers will be presented in the afternoon. Charles M. Schwab, chairman of the board of the institute, will deliver the opening address. Following will be an address by Francis H. Sisson, vice-president, Guaranty Trust Co., New York, on the financial situation and its relation to business recovery; and an address by Charles F. Kettering, president, General Motors Research Corp., New York, on the use of research in industrial and commercial progress. The morning session will be brought to a close with an address by President Lamont of the institute.

The afternoon session will be devoted to the presentation and discussion of but three papers. These will deal with important production problems. "The Use of Rolled Steel in Machine Construction" will be dealt with in a paper by H. G. Marsh, Carnegie Steel Co., Pittsburgh, and discussed by Everett Chapman, first vice-president in charge of engineering, Lukenweld, Inc., Coatesville, Pa., and by Lloyd Jones, manager, E. W. Bliss Co., Salem, Ohio. "The Aging of Mild Steel Sheets" will be dealt with in a paper by Dr. Anson Hayes, director of research, American Rolling Mill Co., Middletown, Ohio, and discussed by Dr. John Johnston, United States Steel Corp., New York. A paper on the "Insulation of Open-Hearth Furnaces" will be presented by E. F. Entwisle, superintendent, Saucon division, Bethlehem Steel Co., Bethlehem, Pa.

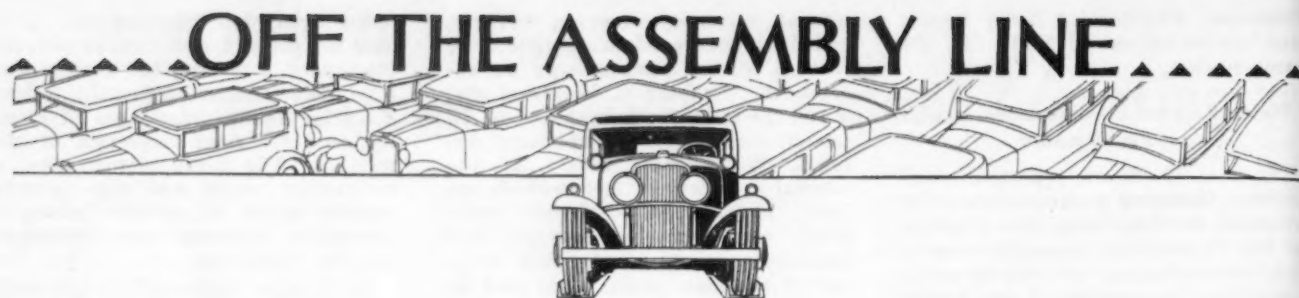
"The steel industries of Europe are being reorganized, and competition at home and abroad is displaying significant trends," said Mr. Lamont. "Therefore the present conference of the American industry comes at a most opportune time. The industry is confronted with the necessity of preparing itself to meet rapidly changing conditions."

Industrial Engineers Meet at Link-Belt Plant

Attendance records were broken for the year when on April 25 the Chicago chapter of the Society of Industrial Engineers met at the Thirtieth Street plant of the Link-Belt Co., Chicago.

Included in the instructive program was a tour of inspection of the plant which was followed by an outline of Link-Belt Co.'s plants, products and organization by A. Kaufman, vice-president and general manager. Cris Berg, consultant, then spoke on industrial engineering practices and accomplishments from 1904 to 1914, this being the period when the Link-Belt Co. laid the foundation and started its work in time study and the improved methods of shop management as laid down by Taylor. H. C. Robson, chief of the time study department, discussed motion-time analysis and time study developments during the period 1914 to 1929, and E. L. Berry, superintendent, placed before the audience developments of the last three years and told of this company's success with motion-time analysis.

Rates on cast iron pipe and fittings, in carloads, from points in Alabama and from Chattanooga, Tenn., to deliveries within the Kansas City, Mo.-Kans., switching limits are not unreasonable, according to a proposed report by Examiner J. P. McGarth of the Interstate Commerce Commission.



Production Gains and Sustained Demand Brighten Automotive Outlook

DETROIT, May 1

AUTOMOBILE production in April is conservatively estimated at 160,000 units, with a strong possibility that the final figure will be nearer 170,000. This compares with 155,136 units in April of last year and is only the third time since August, 1929, when assemblies for any single month have exceeded those in the corresponding month of the preceding year. When the fact is recalled that motor car manufacture was virtually at a halt in the middle of March, this astonishing spurt has added significance.

Optimism so evident in the automobile industry during the past three weeks has risen to new heights. Sales executives are predicting that the strong demand which developed in April will continue through at least May and June. They are more confident than they were a few weeks ago that the sales curve will diminish only gradually during the summer months rather than show a precipitate drop and that retail sales over the entire latter half of the year will be considerably ahead of those in the same period of 1932. They believe that the inflationary program of the administration will influence motorists to spend their money for new cars at present price levels. In fact, indications are that a rise in retail automobile prices is in the offing. Manufacturers declare that the margin between production cost and the wholesale price is so small that a boost in materials prices, which seems inevitable, will necessitate an upward revision of retail prices. The threat of having to pay more for a motor car has been demonstrated on numerous occasions to have been an effective means of increasing sales.

April Showing Exceeds Expectations

A still more tangible reason for optimism is the fine showing most companies made in April, the sales total having exceeded expectations. Chevrolet's retail deliveries crossed the 50,000 mark for the first time this year. In the first 10 days of the month, sales totaled 13,862 cars and

in the second 10 days 17,004. If allowance is made for the normal increase which invariably comes in the last period of the month, April's deliveries will be close to 53,000 units. Incidentally, Chevrolet's sales have shown a gain every month this year, compared with the corresponding month of last year. Its assemblies in April were at least 60,000 units, and its May schedule remains unchanged at 67,000 units. Its manufacturing plants are operating 45 hr. a week, with a few departments running 50 hr. It is understood that Chevrolet is now employing 32,000 men, while Fisher Body has 20,000 men at work on Chevrolet bodies. It is notable that Chevrolet's working force has not varied more than 10 per cent from its present figure for the past three years, although admittedly the earnings of individual employees have varied with the production curve.

Pontiac and Plymouth Pushing Deliveries

Pontiac is working five days a week and last month turned out 8100 cars. In the first 10 days of April its retail deliveries were 2413 cars, and in the second 10 days 2604. Retail sales this year to April 20 amounted to 21,278 cars, as against 19,258 in the same period of 1932. Pontiac has held third place consistently in registrations in Wayne County (Detroit), Mich., since the first of the year. Its May assemblies are expected to be about 9000 units. Buick sold at retail 1405 cars in the first 10 days of April and 1403 cars in the second 10 days. Its present operations are at a rate of 200 cars a day five days a week. Oldsmobile sold 2149 cars in the first 20 days of April.

Plymouth made over 22,000 cars last month and now has 6000 men on its payroll. In the first two weeks since its two new sixes were introduced orders from dealers totaled 21,829 cars. Its field sales promotion staff has been doubled and its office staff increased tenfold. It is now in the midst of a vigorous national advertising campaign. It is pushing its

factory to full capacity, working 24 hr. a day to get its new models into the field. There probably will be no letdown in its output during May.

Ford has increased its production to 2500 units a day five days a week and is employing 30,000 men at the Rouge plant. Its steel purchases the past week have been heavy, having included most of its requirements for May. Ford's suppliers continue to work five and six days a week. Its output this month probably will be about 60,000 cars. Ford is reported to be preparing to divest itself of its credit organization, the Universal Credit Co., by selling it to the Commercial Credit Co., which is one of the larger credit finance companies. Reports that the two leading steel companies are bidding for the Ford steel mills have become more widespread. One authority points out that any steel company which might take over these properties would have to make extensive alterations involving large expenditures to bring production processes into line with economical practice. This is due to the fact that the plant is set up to take care of an ingot less than half the size of the one poured by steel companies for the manufacture of similar grades of steel, and production costs are excessive.

Steel Buying Expanding

Steel purchases the past week were on a still more extensive scale than the previous week, with Ford, Chevrolet and Chrysler the leading buyers. However, steel orders have by no means been confined to these companies. Oldsmobile, Hudson, Packard, Buick and Reo also have been in the market. Motor car makers have been pounding steel mills for deliveries and in turn have been getting steel laid down in their plants within a few hours to 20 hr. of the time it was ordered. In many cases the time element has precluded water shipment, with trucking the favorite method in emergencies. In a few instances mills have had to turn down orders because they could not meet delivery schedules. Great Lakes Steel Corp. con-

tinues at 100 per cent of ingot capacity and its bar, sheet and strip mills are reported operating close to full capacity.

Prospective business from the brewing industry has stimulated commercial car makers to bring out new models especially adapted to the beverage trade. All companies, of course, are making a special drive for sales in that field. During the first 20 days since beer was legalized, Chevrolet dealers sold more than 1500 trucks and passenger cars to brewers and their distributors. Volume sales resulted only in those states where beer was immediately sanctioned.

Stamping operations in the building of Dodge trucks, formerly performed at the Dodge truck plant on Lynch Road, are said to have been moved to the Highland Park plant of the Chrysler Corp. to relieve congestion. Dodge truck production has been so brisk that plans to assemble the DeSoto car in the truck plant are believed to have been abandoned and now Chrysler is understood to be considering the feasibility of making the DeSoto in its Jefferson Avenue plant, in which the Chrysler car is produced. Murray Corp., principally known as a manufacturer of automobile bodies and frames, has begun to make welded, rustless steel barrels for the brewing industry.

Hudson will announce before May 15 a new Terraplane, which will not displace the present sixes and eights, but will be an added model. It will be designed to compete with the Chevrolet, Plymouth and Ford de luxe series.

Trade Commission Makes Resale Stipulations

WASHINGTON, May 1.—The Federal Trade Commission has entered into stipulation agreements with four machinery companies of the East and Middle West in which the latter agree to discontinue resale price maintenance methods. These companies are Sullivan Machinery Co., Chicago; Chicago Pneumatic Tool Co., New York; The Cleveland Rock Drill Co., Cleveland; and Independent Pneumatic Tool Co., Chicago.

Each company agreed to cease and desist from use of the following cooperative methods, or any of them; seeking or securing from the retail or other trade, agreements, promises or assurances of cooperation in the maintenance of any system of resale prices whatsoever; including in the contracts with the distributors any promise or agreement to maintain resale prices established or suggested by the company for the resale of its products; directly or indirectly establishing or carrying into effect by cooperative methods any system whatsoever for the maintenance of resale prices on the companies' products by its distributors.

Foreign Trade Council Reviews America's Export Problems

Recommends Government Guarantee-Insurance of Long Term Credits to Protect Exporters

GOVERNMENT assistance in the extension of foreign trade was one of the principal recommendations approved at the twentieth annual meeting of the National Foreign Trade Council held last week at the William Penn Hotel, Pittsburgh. It was suggested that such assistance might be given through guarantee-insurance on long term credits to protect American exporters against loss in extending credit abroad. The convention also recommended that official United States delegates at the forthcoming international economic and monetary conference should be instructed to agree to the consideration of all measures which will promote the normal interchange of goods between nations. These might include stabilization of exchanges and the re-establishment of international gold standards based on requirements of the respective countries in relation to their own national economy.

The Council also urged the gradual elimination of governmental competition with privately owned American steamship lines in overseas and intercoastal services. Other recommendations made included establishment of reciprocal tariffs looking toward a general lowering of trade barriers throughout the world; financial aid to Latin American countries; establishment of a sound monetary system among world powers; investing in the President the authority to change by executive order any rates of duty within 50 per cent of rates of the tariff act of 1930, and a vigorous effort to bring back to the United States the more than \$100,000,000 of American funds arising out of the export of goods, services and private investments which had been impounded by governmental decree in foreign countries having restrictions.

James A. Farrell, chairman of the National Foreign Trade Council, presented a notable paper in which he discussed the relation of tariffs to depression conditions. His address is abstracted at length elsewhere in this issue.

Laying of international foundations for trade recovery was discussed by Dr. Lionel D. Edie, president Capital Research Co., Inc., New York. "We shall not come to the rescue," said Dr. Edie, "by following the recent wild talk about a new inflation on the grand scale. The clamor to go to extremes is fraught with danger. A violent inflation will slaughter contracts just as effectively as the violent deflation which we have been going through.

"We can rebuild confidence in contracts only if we rebuild confidence in what your money is going to be worth, confidence in a determination of monetary powers to combat both violent inflation and violent deflation, confidence in an orderly world price level.

"There are three primary requirements. First, we must restabilize the foreign exchange markets of the world. This means putting an end to the war of depreciated currencies as a means of gaining a slight competitive advantage, bringing sudden flights of capital under international control, and better international book-keeping so that we may know definitely what a nation's balance of payments is.

"Second, we must define the responsibility of central banks and government treasuries for the broad movements of the world price level.

"Third, we must rebuild our domestic market as an independent market. It is our first duty to restore equilibrium in this domestic market and to make it function in its own right. In order to accomplish this end we have to start the circulation between producers of basic raw materials and producers of manufactured products. A rebalancing of farm prices and of the prices of manufactured products is indispensable.

The effectiveness of the Bureau of Foreign and Domestic Commerce set up in the Department of Commerce during the Wilson administration was praised by A. M. Hamilton, foreign sales manager American Locomotive Sales Corp., New York, in a talk on the reconstruction of the foreign service.

Foreign trade possibilities in the Pacific were emphasized by Raymond Mackay, division of Far Eastern Affairs, Department of State, Washington. Mr. Mackay pointed out that our exports to the Far East during 1932 were 20 per cent of our total, the largest ratio in history, while its decrease from previous years was the smallest in any zone. Nevertheless, competition is tightening, with Japanese firms doubling and trebling their exports since that country went off the gold standard in 1931.

The various obstacles to be met and overcome in arranging for foreign manufacture by American companies were discussed by C. M. Peter, export manager Black & Decker Mfg. Co., Towson, Md.

New York Holds Stainless Steel Meeting and Exhibition

INTEREST in steels of the stainless and heat-resisting variety was evidenced in no uncertain manner by an enthusiastic meeting in the Engineering Societies Building, New York, on the evening of April 26. And, preceding the presentation of papers in the building's large auditorium, which was filled substantially to capacity, an exhibition of the steels, set up in the lobby of the building, was visited by upward of 700. The meeting itself was addressed by Dr. Marcus A. Grossman, research engineer, Illinois Steel Co.; Dr. Frederick M. Becket, president, Union

Carbide & Carbon Research Laboratories, Inc., and president of the American Institute of Mining and Metallurgical Engineers, and Dr. Walter M. Mitchell, metallurgical engineer in New York for subsidiaries of the United States Steel Corp. George H. Charls, secretary of the American Iron and Steel Institute and an early exponent of stainless steels as proved by his activities when president of the United Alloy Steel Corp., presided.

Dr. Grossman traced the development of stainless steel and touched at some length on the present state

of the art. Dr. Becket devoted himself largely to pointing out the role of chromium as a steel alloying element, particularly in steels required to maintain full strength when used at elevated temperatures. Dr. Mitchell dwelt on the uses and applications of stainless steels, illustrating his points by means of lantern photographs. A brief informal discussion entered into by users and fabricators of the material followed the reading of the papers.

One of the features of Dr. Mitchell's contribution was a compilation which is reproduced in the accompanying table. This had been prepared by the research laboratory of the United States Steel Corp. and lists the composition, physical properties and the mechanical properties of the steels of the class made by the corporation.

Properties of U.S.S. Stainless and Heat-Resisting Steels

Type of Alloy	4-6 Cr	USS 12*	USS 17	USS 27	USS 18-8	USS 18-8 Stabilized	USS 18-12	USS 25-12
Composition: Chromium, per cent.	4-6	12-14	16-18	25-30	17-19	17-19	17-19	22-28
Nickel, per cent.	0.50	0.50	0.50	0.50	8-10	8-10	11-12.5	12-16
Si and Mn (max.), per cent.	0.10-0.20	0.10 max.	0.10 max.	0.10 max.	0.50	0.50	0.50	0.25 max.
Carbon, per cent.	0.10-0.20	0.10 max.	0.10 max.	0.10 max.	0.05-0.15	0.05-0.15	0.05-0.15	0.25 max.
PHYSICAL PROPERTIES								
Specific gravity: lb. per cu. in. (low carbon steel = 1.00)	0.280	0.276	0.273	0.270	0.266	0.285	0.287	0.283
Specific electrical resistance: microhms per cm. cube (low carbon steel = 1.00)	60	5.5	65	68	70 { cold-worked = 70-82	71	73	80
Melting range, deg. F.	2760-2800	2750-2790	2710-2750	2710-2750	2550-2590	2550-2590	2550-2590	2530-2570
Structure	Ferritic	Ferritic	Ferritic	Ferritic	Austenitic	Austenitic	Austenitic	Austenitic
Magnetic permeability, as annealed after 10 per cent reduction of area	Ferro-magnetic	Ferro-magnetic	Ferro-magnetic	Ferro-magnetic	$\mu = 1.003$ $\mu = 1.10$	$\mu = 1.003$	$\mu = 1.003$ $\mu = 1.006$	$\mu = 1.003$ $\mu = 1.003$
Specific heat: cal/deg. C/gm (0-100 deg. C) (low carbon steel = 1.00)	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12
Thermal conductivity: cal/cm ² /sec/deg. C/cm at 100 deg. C (low carbon steel = 1.00) at 500 deg. C	0.0874 0.0803	0.0595 0.0686	0.0583 0.0624	0.0500 0.0583	0.0390 0.0515	0.0385 0.0528	0.0380 0.0520	0.03-0.04
Coef. thermal expansion: per deg. F (32-312 deg. F) x 10 ⁶ (low carbon steel = 1.00) (32-932 deg. F)	6.1 7.2	6.1 0.93	6.0 0.91	5.9 0.90	9.6 10.2	9.3 10.3	9.9 10.8	8.3 9.6
MECHANICAL PROPERTIES AT ROOM TEMPERATURE								
	Annealed	Quenched and drawn at 1100 deg. F	Annealed	Quenched and drawn at 1100 deg. F	Annealed	Cold-worked (wire)	Annealed	Cold-worked (wire)
Ultimate strength: 10 ⁴ lb./sq. in.	66	115	65	125	75	100-190	75-95	85-175
Yield point: 10 ⁴ lb./sq. in.	27	103	35	100	40	50-60	55-155	40
Elastic modulus: 10 ⁶ lb./sq. in.	29	28	29	29	29	29	29	29
Elongation in 2 in., per cent	38	20	35	20	27	25-2(10")	20-30	25-2(10")
Reduction in area, per cent	76	66	65	60	55	40-20	50-60	55-25
Impact ft. lb. { Charpy Isod.	80	75	80	75	8-25	75-110	75-110	77
Fatigue resistance endurance limit: 10 ⁴ lb./sq. in.	136	250	140	230	175	185-270	160-190	150-250
Brinell hardness number	B75	C24	B76	C22	B85	B90-105	B80-90	C0-25
Rockwell hardness number					7-9			
Erichsen value, mm.								
Stress causing 1 per cent "creep" in 10000 hr. lb./sq. in.	at 1000 deg. F = 7,000	1000 deg. F = 13,000 1200 deg. F = 2,300 1350 deg. F = 1,400	1000 deg. F = 8,500 1200 deg. F = 2,100 1350 deg. F = 1,200	1200 deg. F = 1,600 1350 deg. F = 400	1000 deg. F = 17,000 1200 deg. F = 7,000 1350 deg. F = 3,000 1500 deg. F = 850	150-185 B80-90	135-165 B75-85	150-185 B80-90
Sealing temperature, deg. F (approx.)	1200	1300	1550	2100	2200	2200	2200	2200
Initial forging temperature, deg. F	2100	2100	2000	2200	2200	2200	2200	2200
Finishing temperature, deg. F	about 1400	not over 1450	not over 1400	not over 1400-1450	not under 1600-1700	not under 1600-1700	not under 1600-1700	not under 1600-1700
Annealing treatment	Furnace cool from 1580 deg. F	Prolonged heating at 1250-1350 deg. F (C)	(A)	One hour or more at 1450 deg. F and quench (D)	Heat at 1900-2000 deg. F and quench (E)	(B)	" " "	Heat at 2000-2150 deg. F and quench (E)
Precautions			(D)				(E)	

* A modification of USS12 with similar properties but greater ease of machining has been developed and designated USS 12 Z.

Notes: (A) Small cold reduction followed by anneal at 1400 deg. F, quench.

(B) Final heat-treatment must consist of 2-4 hr. at 1550 deg. F.

(C) Preheat slowly to 1450 deg. F, rapidly to 2100 deg. F for forging. Full corrosion resistance developed only in heat-treated condition. (Temper below 1000 deg. F).

(D) In forging, preheat as above; excessive grain growth above 2000 deg. F. Expert welding required to avoid excessive grain growth. Prolonged exposure at 850-950 deg. F produces cold brittleness. To prevent, heat to 1400 deg. F before cooling and quench.

(E) Preheat slowly to 1600 deg. F then rapidly to forging or annealing temperature. Exposure to temperatures between 1000-1500 deg. F produces marked susceptibility to intergranular corrosion. If unstaked can be cured by repeating annealing treatment.

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nconfirmed)

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A review of the papers themselves will appear in a later issue.

The exhibition covered the chromium-nickel and other steels of the special class as made by the Illinois Steel Co. for further fabrication by the American Sheet & Tin Plate Co., the American Steel & Wire Co. and the National Tube Co., as well as the Illinois and the Carnegie companies. Besides the finished-steel displays of these companies, there was an impos-

ing array of products of users of the steel, covering surgical and hospital equipment, dental goods, hardware and household utensils, equipment for the food industries and building trim.

The meeting was held jointly by the New York divisions of the societies of mechanical engineers, mining and metallurgical engineers, the American Welding Society, the American Society for Steel Treating and the Electrochemical Society.

Great Britain Makes Trade Pacts with Germany, Argentina and Denmark

LONDON, ENGLAND, May 1 (By Cable).—The United Kingdom has concluded trade pacts with Germany, Argentina and Denmark. The latter includes free admission into Denmark of British pig iron, steel bars, hoops, rods, plates and sheets.

Pig iron is quieter but production is still maintained.

Export steel demand is dull, but domestic structural engineering requirements are broadening. Tin plate is firm, largely because of the rise in prices of pig tin. Tin plate prices are likely to go higher if the advance in pig tin continues. Tin plate inquiry is increasing.

Sales offices of the Continental Steel

Cartel have not yet been definitely established owing to disagreement over proposed Belgian quotas. A further meeting will be held in Luxembourg on May 5. If an agreement is finally reached, sales offices should be in operation by June 1.

The renewed International Tube Cartel comprises a Continental group and an Anglo-Saxon group, in which latter are Great Britain, United States and Canada. The Continental Hoop Iron Cartel is expected to start functioning about the middle of May. A meeting of the International Wire Export Co. will be held in Brussels on May 3. A Danish-Swedish consortium has been concluded with an agreement to build a trans-Persian railway costing 320,000,000 Swedish Kroner.

British Prices f.o.b. United Kingdom

Ports			
Per Gross Ton			
Ferromanganese, export	\$9		
Billets, open-hearth	\$5	to \$5 7s. 6d.	
Black sheets, Japanese specifications	\$11		
Tin plate, per base box	16s.	to 16s. 6d.	
Steel bars, open-hearth	\$7 17½s.	to \$8 7½s.	
Beams, open-hearth	\$7 7½s.	to \$7 17½s.	
Channels, open-hearth	\$7 12½s.	to \$8 2½s.	
Angles, open-hearth	\$7 7½s.	to \$7 17½s.	
Black sheets, No. 24 gage	\$8 10s.		
Galvanized sheets, No. 24 gage	\$10 10s.	to \$10 15s.	

Continental Prices, f.o.b. Continental

Ports		Per Metric Ton, Gold £ at \$4.86	
Billets, Thomas...	£2 5s.		
Wire rods, No. 5			
B.W.G.	£4 10s.		
Black sheets, No. 31 gage, Japanese	£11 5s.		
Steel bars, merchant	£2 14s.		
Beams, Thomas...	£2 10s.		
Angles, Thomas			
4-in. and larger	£2 9s.		
Angles, small	£2 13s.		6d.
Hoops and strip steel over 6-in. base	£3 15s.		
Wire, plain, No. 8	£5 7s.		6d.
Wire nails	£5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G.	£3 15s.		

Cast Iron Pipe

Connecticut is in the market for 2150 tons of 20-in. pipe for a line from Stamford to Greenwich.

Lynn, Mass., has closed bids on 10,000 ft. of 6-in. class B, cement-lined pipe.

St. Louis has divided 3800 tons among McWane Cast Iron Pipe Co., American Cast Iron Pipe Co. and National Cast Iron Pipe Co.

Menlo Park, Cal., has awarded 141 tons of 6- and 10-in. to United States Pipe & Foundry Co.

Lynwood, Cal., has plans for 328 tons of 12-in.

South Pasadena, Cal., will take bids soon for 129 tons of 10-in.

Laguna Beach, Cal., is contemplating improvements to its sewage system which will require 237 tons of 6 to 12-in.

Pittsburg, Cal., is considering new water system requiring 972 tons of 18 in.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until May 31 for about 3736 ft. of 6-in. for water line at Naval base, Pearl Harbor, T. H., approximately 3180 ft. to be submerged (Specification 7209).

Alhambra, Cal., has plans for pipe line for water development in Rio Hondo district totaling 25,000 ft. of 18 to 24-in. Special election will be called on June 6 to vote bonds of \$340,000 for work. Burns-McDonnell-Smith Corp., Western Pacific Building, Los Angeles, is consulting engineer.

Seattle will ask bids in 30 to 60 days for 20-in. line for water service in western part

of city, replacing present wood pipe. Cost about \$100,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 16 for about 6000 ft. soil pipe for Eastern and Western Navy yards (Schedule 9984).

Pipe Lines

Humble Oil & Refining Co., Houston, Tex., has authorized welded steel pipe line from oil fields near Red Rock, Bastrop County, Tex., to connection with main trunk system from Luling, Tex., oil field, about 30 miles.

Denton, Mont., is considering installation of steel pipe line to replace portion of present line for water service. John E. Dickson is city clerk.

Ozona Gas Co., Ozona, Tex., recently organized by H. Loomis, 413 South Washington Street, San Angelo, Tex., and associates, is having surveys made for welded steel pipe line for natural gas supply at Ozona and vicinity. M. G. Williams, Gorman, Tex., will be an official of company. Cost \$40,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 16 for steel pipe and tubing; also, wrought iron pipe for Eastern and Western Navy yards (Schedule 4).

Sinclair-Prairie Pipe Line Co., Tulsa, Okla., affiliated with Sinclair Refining Co., New York, let contract to Meador & Whittaker, Burkburnett, Tex., and Truman & Smith, Eldorado, Kan., for 12-in. welded steel crude oil pipe line from point near Teague, Tex., to Houston, Tex., about 150 miles.

Coming Meetings

Chamber of Commerce of the United States. May 2 to 5. Annual meeting, Washington. D. A. Skinner, 1615 H Street, N. W., Washington.

American Gear Manufacturers' Association. May 4 to 6. Annual meeting, Penn-Lincoln Hotel, Wilkinsburg, (Pittsburgh). J. C. McQuiston, First National Bank Building, Wilkinsburg, Pa., secretary.

American Supply & Machinery Manufacturers' Association. May 8 to 11. Annual meeting, Louisville, Ky. R. Kennedy Hanson, Clark Building, Pittsburgh, secretary.

Cleveland Engineering Society. May 11 and 12. Conference on "Reengineering for Economical Manufacture" in cooperation with Case School of Applied Science, at the Case School, Cleveland. Prof. E. S. Ault, chairman.

Electrochemical Society. May 11 to 13. Annual spring meeting, Windsor Hotel, Montreal. Colin G. Fink, Columbia University, New York, secretary.

American Steel Warehouse Association. May 23 and 24. Twenty-fourth annual meeting, Commodore Hotel, New York. B. R. Sackett, 505 Arch Street, Philadelphia, secretary-treasurer.

American Iron and Steel Institute. May 25. Annual meeting, Hotel Commodore, New York. Howard H. Cook, Empire State Building, New York, secretary.

American Society of Mechanical Engineers. May 25 and 26. Lubrication engineering meeting, Pennsylvania State College. Prof. F. G. Hechler, Pennsylvania State College, State College, Pa., chairman.

Railroad Equipment

Shipments of railroad locomotives in March totaled only two engines, both of them electric locomotives. In our issue of April 20 it was incorrectly stated that 69 units had been shipped. This figure referred to unfilled orders, of which 67 were electric and two of the steam type.

National Poultry Car Co., Chicago, is inquiring for 100 cars for transporting live poultry.

War Department will receive bids up to May 8 on a 25-ton gas-electric locomotive and six smaller locomotives.

Continuous Planetary Miller

Gives High Output

THE Hall Planetary Co., Philadelphia, has announced a new precision planetary milling machine having six milling heads that revolve continuously around a vertical central supporting column, making possible, it is stated, the speeding up of production far beyond present standards, while at the same time holding the unusually close tolerances possible with planetary milling.

The machine is an adaptation of the company's standard horizontal and multiple-head planetary millers, the machining principles of which, due to the planet-like orbit taken by the cutter around the stationary work, are designated as Planathreading and Planamilling, respectively. The continuous planetary process, however, goes further than the former planetary milling in that it pegs production at a predetermined rate by means of timing gears that definitely control output. With the machine timed at 2 r.p.m. and all heads operating, 12 pieces of work must be produced a minute. Once started the machine is not stopped, provision even being made for replacing dull cutters without interfering with the continuous operation of other milling heads. Furthermore, in combining six machines into one, the continuous miller reduces floor space and enables operation of all six units by one man.

Many kinds of operations in the general class of thread milling and circular milling are performed on

standard machinery parts, and frequently several operations may be performed simultaneously. Production figures on various classes of work are given in the accompanying chart; tolerances at these rates are said to be held as close as 0.00025 in. In addition to the work listed, automotive parts handled include rear axle housings; shock absorber housings, caps and reservoirs; roller bearings; and gears and pinions. All classes of threading may be done on automotive parts, pipe fittings, valves, etc. In ordnance work, shells of all sizes and their component parts are said to be machined at a higher production rate than usual and at lower cost.

Arrangement of the new machine may be seen from the illustration. The main drive is by a 7-hp. vertical motor through a large ring gear located beneath the chip apron. Milling spindles are driven by individual vertically-mounted motors through silent chain drive. Feed box gears are driven directly by a large spur gear bolted to the stationary central column. Two cam rings bolted to the central column control the feeds of the milling heads, and also actuate the six automatic work-holding fixtures. These chucking fixtures, mounted beneath each planetary head, locate the work as well as chuck it. Chip disposal is adequately provided for, the chips being scraped off the chip and oil apron, hoed around an en-

compassing ditch in the base of the machine, and finally dropped into a large chip box. The machine occupies floor space of 8 x 8 ft. and is 8 ft. high. It weighs 30,000 lb.

Push Button Operation

Pressing a push button starts the planetary heads revolving about the central column. As the heads arrive at the loading station they are thrown in and out of operation by pushing the buttons on each head, starting the spindle drive, and at the same time throwing an individual handlever controlling the automatic planetary feed. This done, it is only necessary to load and unload the work from the machine. Cutters may be replaced by the operator walking once around the machine, the entire operation taking about 20 sec.

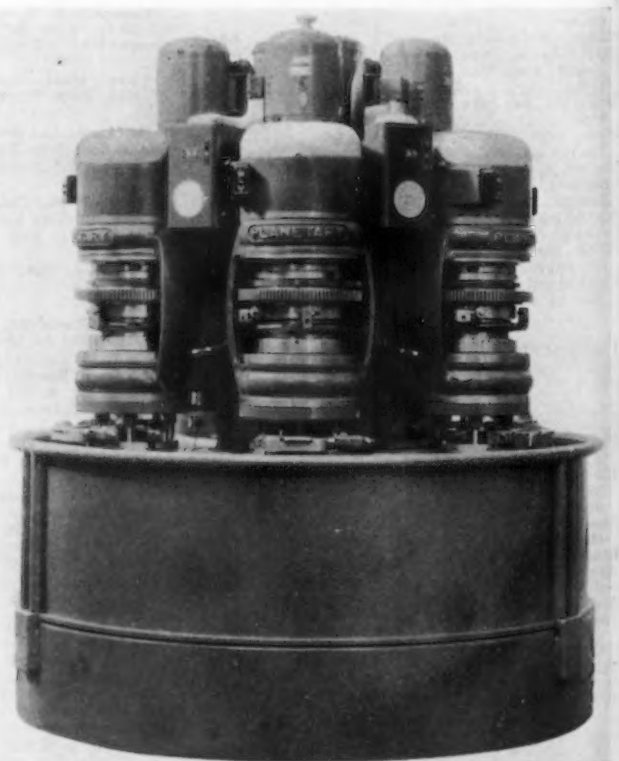
With the individually motorized heads, the independent feed controls and the individual fixture throw-outs, the operator may throw any of the six units in and out of production as conditions, including temporary failure or repairs, may warrant.

A departure from standard milling practice has made it possible to control the diameter milled in the work after the cutters have been reground. This is accomplished by using cutters in heads Nos. 1 and 6 consecutively and in between regrinding to specified sizes for each numbered head. This regrinding of cutters to specified sizes is emphasized as eliminating shutdowns due to setting to size. In locating the work with respect to the cutter it is also unnecessary to stop the machine. A mild wedge actuated by a large graduated dial permits adjustments

PRODUCTION CHART FOR CONTINUOUS PLANETARY

Product	Operation	Material	Production— Per* 60 Sec. Day's (Floor to Run Floor) (9 Hr.)	
Ammunition	Thread milling nose of shell, 1 1/2-in. P.D. by 3/4-in. long thread	Cr-Ni Steel	12	6,480
Pipe Coupling	Complete simultaneous thread milling of both ends, 8 5/8-in. P.D. by 3 1/2-in. long thread	High Carbon Steel	2	1,080
Auto Hubs	Form milling two complete bearing seats, 5 in. and 2 in. diameter	Forging Steel	10	5,400
Bearing Race	Form milling entire bore and ball grooves	Cr-Mo Steel	40	21,600
Differential Carrier	Simultaneous thread milling both ends	Malleable Iron	8	4,320
Shock Absorber	Simultaneous complete finish milling of entire inside	Forging Steel	10	5,400

WITH six milling heads revolving continuously around the central column, production is markedly increased without sacrifice of the close tolerances possible with planetary milling



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as fine as 0.00025 in., while running, to the location of each chucking fixture.

The machine has been designed to permit automatic loading from a conveyor, if desired. It is also arranged so that two or more different pieces of work can be loaded into alternate heads by the one operator. It can be furnished with as few as two heads; in this case standard heads can be added later as production might warrant. The machine is designed to give planetary approach or non-burring first thread in thread milling work.

An important universal feature is the possibility of taking a roughing and a finishing cut without unchucking the work. This may be done either by mounting a roughing and finishing cutter on the same arbor and consecutively registering the work with each, or by indexing the holding fixtures between roughing and finishing heads.

Flood oiling of all moving parts of the machine is accomplished by an independent motor-driven pump. The oil is forced up the central column, distributed to the six heads and finally returned to the oil reservoir, where it is filtered. The system permits lubrication of the machine before starting.

Magnetic Oil Filter Provided

Magnetic as well as mechanical oil filtering is provided. The magnetic method, a new feature, is by means of a tube surrounded by six strong magnets. The tube contains a cartridge of 50 parallel $\frac{1}{8}$ -in. Swedish steel wires in which magnetic forces are induced by the outside magnets. This cartridge may be removed, cleaned and replaced conveniently. The mechanical filtering is by means of an automatically operated Cuno filter.

Cutting oil in large volume is also supplied automatically to both the work and the cutter. Opening of the fixture during reloading automatically shuts off the coolant at the loading station.

Accurate construction is a feature of the machine. Spindle bearings, eccentric sleeves, and main bearings are lapped, and chucking fixtures are tied directly with the milling head to assure rigidity in chucking the work. Considerable attention has also been given to beautiful appearance; this has been obtained by compactness, symmetrical contours, elimination of sharp corners, concealment of piping and wires, and sinking of bolt heads, and without sacrifice of efficiency or of accessibility of parts.

Steel and concrete flumes will replace wood flumes in an irrigation project near Phoenix, Ariz., for which \$1,350,000 has been loaned by the Reconstruction Finance Corp. to the Maricopa County Municipal Water Conservation District No. 1 of Phoenix.

Double-End Machine Mills and Centers Shafts Automatically

FOR milling to length and centering to uniform depth both ends of shafts, stem gears and similar pieces, preparatory to the turning operations, the Jones & Lamson Machine Co., Springfield, Vt., has developed the automatic double-end milling and centering machine illustrated.

The machine has a single pulley drive, and a variable-speed headstock which gives three speed changes through sliding gears. Gears and shafts are hardened and ground and are carried in ball bearings. The milling and centering spindles are mounted on ball bearings set up under a predetermined load.

The right-hand milling head is adjustable on the ways of the machine through a lead-screw located at the rear. By loosening two clamp screws both work-supports can be moved longitudinally on the center bar to suit various lengths of work.

All movements of the machine are controlled by hardened cams on the outside of the cam drums, and the work-holding units are supported on hardened and ground former blocks, shown at C in the illustration. The work is clamped in hardened V-blocks by electric torque motors, D, which are operated by the conveniently located drum switch E.

Nine feeds, ranging from 3 to 22 in. per min., are obtainable through pick-off gears located in housing G. The fast motion of the machine is obtained through a multiple-disk clutch and drive shaft at the rear.

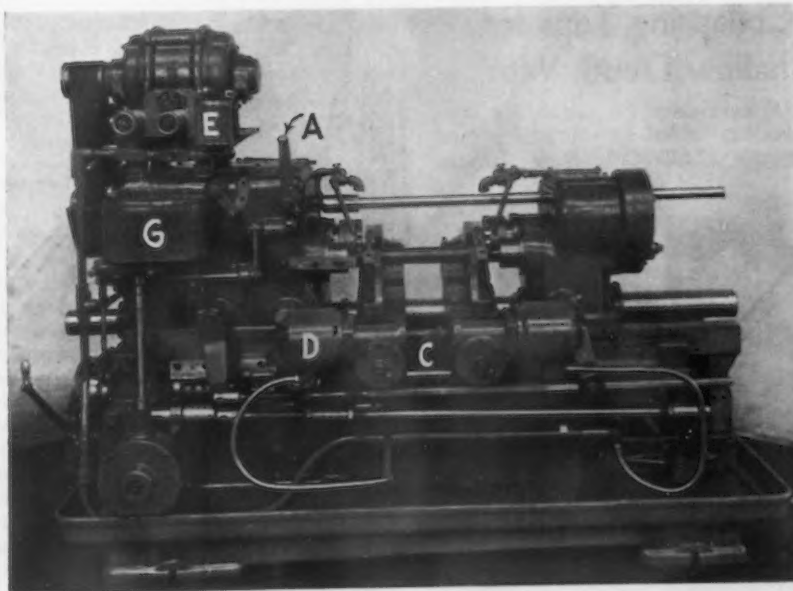
The machine is built in various bed lengths with maximum distance between milling cutters of 20, 32, 44, 62 and 80 in. For short work, the

right-hand work-holding fixture can be removed and the right-hand head moved up accordingly; with this arrangement the length of the work that can be milled and centered depends only upon the width of the remaining V-block and holder.

The standard V-blocks, cutters and cams are designed for round stock from $\frac{1}{4}$ to $3\frac{1}{2}$ in. in diameter, but additional V-blocks, cams and cutters can be furnished for work up to and including $4\frac{1}{2}$ in. Standard equipment includes coolant pump, piping, splash guards, and hand-operated clamping units.

In operating the machine the work is first clamped in the V-blocks by the electric torque motors, and the machine then started by lever A. The work-holding units move rapidly to the milling cutters and both ends of the shaft are milled simultaneously to the required length. Upon completion of the milling cuts, the machine goes into fast motion, moves the work to the centering position and both ends are centered to uniform depth. The centers are then withdrawn in fast motion and the machine stops.

Lubricating pastes for steam and water packings and for packings working against gasoline and oils have been developed by the Garlock Packing Co., Palmyra, N. Y. These pastes, designated as the Nos. 2 and 3, respectively, are available in 12 and 24-oz. cans, in 5-lb. cans and in larger special containers of any size. Applied to packings at regular intervals, these pastes are said to reduce friction and prolong the life of the packings.

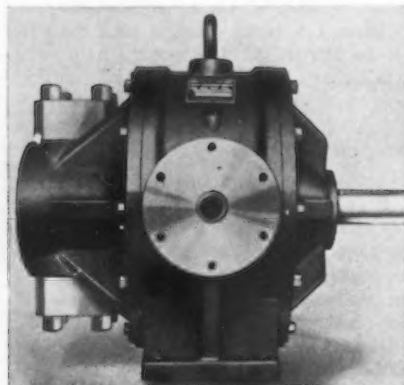


Both ends of shafts, stem gears and similar pieces are milled to length and centered preparatory to turning operations

Pump for High-Pressure Hydraulic Transmissions

A NEW series of radial pumps for generating pressure for the operation of hydraulically-actuated machinery such as presses, machine tools, welding machines and steel mill machinery has been announced by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

This pump is said to be particularly suited for application to heavy-duty

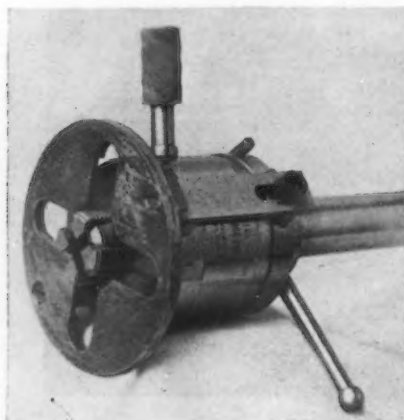


Pump for pressures up to 3000 lb.

production machines requiring high pressures. It is of positive displacement, multiple radial plunger, oil pressure type, having a number of new features. The output is both variable in volume and reversible in direction of flow. Advantages claimed include high mechanical and hydraulic efficiency, smooth delivery, positive displacement throughout section and delivery, ruggedness, and minimum number of parts. Six sizes, ranging from 1 to 100 gal. per min., with pressure capacities up to 3000 lb. per sq. in., are built. All features of design are covered by patents or pending applications.

Collapsing Taps for Shallow Depth Work

THE new class PS collapsing taps recently added to the line of the Geometric Tool Co., New Haven,



Sensitive tripping is a feature

Conn., are designed to handle a wide range of work on shallow depth tapping, and where necessary to clear obstructions or projections at the bottom of the hole.

Sensitive, precision tripping is a feature. The PS tap may be tripped either by the conventional trip plate or it may be used as a lever trip tool without the necessity of obtaining any extra parts. To use the tap as a lever trip tool, a suitable stop can be rigged up on the cross-slide to contact the long handle at the rear of the body of the tool. When used as a lever trip tap the finished thread may be as short as desired.

This tool is built for use as a stationary tap only. The closing action

is at right angles to the axis of the tool with the chasers positively cammed open and closed. After the thread has been cut to the desired depth and the chasers automatically released, the chasers are set in cutting position by a conveniently placed handle.

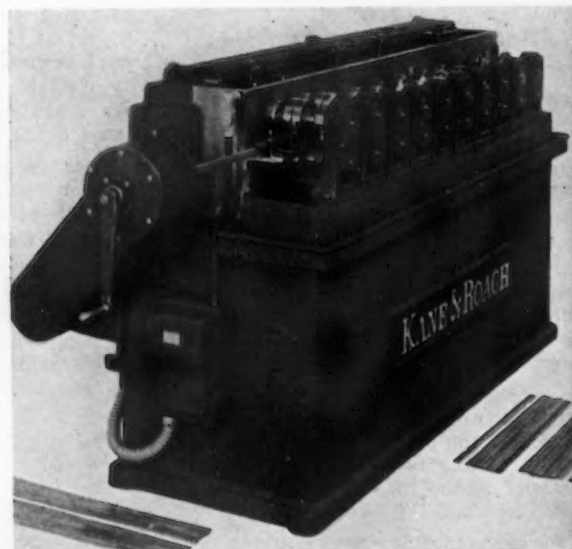
Chasers are furnished in one thread length only. Standard chasers can be used for bottoming work, and by altering them and the supporting boss slightly, the tap will clear obstructions or projections at the bottom of the hole. The PS taps are made in three sizes covering a range from 1 3/8 to 6 in. Each tap handles a wide range, the 3 in. size covering all diameters from 1 3/8 to 3 in.

High-Speed Cold Roll Forming Machine

AN outboard-housing type cold roll former that produces at the rate of 270 ft. per min. has been placed on the market by Kane & Roach, Inc., Syracuse, N. Y. Machines of this model, the No. 00X, are suitable for

venient take-up of slack in the V-belts, which are entirely inclosed and protected, as shown. The cabinet base of the machine is of substantial construction. It has a trough around the top for returning the coolant and for

AUTOMOBILE radiator tubes are formed from Lake copper tin-coated stock at the rate of 270 ft. per min. Stock may also be taken from the coil, cut and fed into the machine at the same rate



rolling a wide variety of shapes and sections, and can be furnished in several sizes and with various numbers of roll stands.

The drive from the motor is by V-belts to a main shaft to which is coupled a series of worm reduction units, each of which drives a proportionate number of roll stands. The worm drives, couplings and spur gears operate in oil carried in oil-tight cases, and all bottom roll shaft, and intermediate shaft bearings are lubricated automatically from the oil supply in the case. The few remaining bearings are high-pressure Alemite lubricated. The driving motor is accessibly mounted on a hinged sub-base at the rear of the cabinet base. The hinged sub-base provides for con-

catching any overflow of lubricant from the bearings, preventing any oil seepage on the sides of the machine.

A machine of the same type but arranged for taking stock from the coil, cutting and feeding it into the forming machine in cut lengths at the same high production, has also been built.

A new type of safety switch for electric circuits has been brought out by the Electric Controller & Mfg. Co., Cleveland. The fuse door of the switch, which is of the double-break design with semi-floating V-blades, is interlocked with the operating handle so that raising the door trips the switch and the fuses cannot be reached except when the switch is open.

Tariff Not Responsible for Slump, Says J. A. Farrell

Charge of Economic Isolation and Failure to Fill Role of Creditor Nation Unfounded, He Tells Foreign Trade Body

OUR tariff has not been a major cause of international trade stagnation; nor can it be fairly charged that we have failed the world as a creditor nation, declared James A. Farrell, chairman of the National Foreign Trade Council, in an address at the twentieth meeting of that organization at Pittsburgh, April 26.

"Economic nationalism as a term of reproach is applied so frequently by other countries to our fiscal policy," said Mr. Farrell, "that it seems necessary to expose the mistaken assumptions upon which this charge rests. So far from our tariff law being responsible for the secondary causes of the depression—set up by the resort of 45 countries to depreciation of their currencies, and to tariff barriers in restraint of imports—our tariff law, on the contrary, has proved inadequate security against injurious competition. That it no longer is a protective tariff is evidenced by its failure to accomplish for American industries what Great Britain, France, Canada and other countries have done by means of supertaxes on imports from countries with depreciated currencies. France recently increased currency surcharges from 15 to 25 per cent on imports from countries with depreciated currencies, and has extended these surcharges to a number of other countries. Germany has been increasing a wide range of her duties on imports. Similar tendencies in other European countries have been more marked during the past six months.

Our Bargaining Position Poor

"In the United States, we not only have not increased our rates of duty, but have permitted currency depreciation abroad to nullify much of the protection intended by our tariff law. Had measures not been taken recently which afford us some measure of protection against the instability of foreign currencies, we would have entered into present negotiations at Washington, and into the world conference, with little if any bargaining power in the hands of our negotiators.

"Our decline in export trade is not due, as some allege, to justifiable reprisals provoked by our tariff law. This decline is due not alone to unjustifiable discrimination against our trade, but to a combination of unsettling influences abroad that have reduced the buying power of countries which have been unable to overcome the secondary effects of the war period. Nor is it correct to say that this decline in our exports is due to

our altered position as a creditor nation. Tariff reductions in the United States would have had no material effect in preventing the monetary and economic difficulties abroad which had their origin in unstable political and social conditions unrelated to the tariff question.

Can't Settle Problems With 2-Ft. Rule

"There is a school of thought in this country which would settle the economic troubles of the world with a 2-ft. rule. From this source the idea has emanated that the trade of the world could be restored overnight by a horizontal reduction of all tariffs. A proneness to indulge in vague generalities obscures for these amateur economists the ultimate effects which inevitably must ensue from the practical application of their theories.

"To those who contend that, as a creditor country, it is incumbent upon us to modify, or altogether abolish, the protective principle, it may be answered that our position as a creditor nation does not relieve us of the onus of maintaining our standard of living, and of securing employment for the worker. Nor does it lay upon us the responsibility of discouraging thousands now engaged in export business, by arbitrary tariff reductions calculated to impair or destroy their legitimate enterprises in the foreign field.

We Have Not Failed as Creditor Nation

"The charge sometimes heard that we have failed the world as a creditor nation, finds no support in the 30 billion dollars of American money loaned abroad by our Government and by private investors. Two chief factors entered into the transfer of payments to the United States before this depression set in—the \$800,000,000 annually expended by American tourists in foreign countries, and our annual loans abroad of approximately one billion dollars. If these factors have ceased to operate, it is due to causes abroad that have made it no longer possible for our country to function normally as a creditor nation.

"The assertion that the Ottawa trade agreements were in the nature of reprisals provoked by our tariff law will not bear serious investigation. Prior to the Ottawa conference, it was complained by English statesmen that the trade of Great Britain with foreign countries exceeded by \$400,000,000 her trade with the rest of the Empire. Less than one-third of Britain's imports came from countries

within the Empire, and less than half her exports went to Empire countries. Preferential tariffs, discriminatory against the trade of the United States, have been in operation since the beginning of the century. From the beginning of the war, Great Britain ceased to be a free trade country. The tariff reform movement in Great Britain had its inception at the close of the century, and finally culminated in a more extensive tariff protection policy. It cannot fairly be claimed, therefore, that the Ottawa agreements—inspired by political as well as economic reasons—were the result of our tariff law.

Return to Stable Currencies Paramount Consideration

"These isolationist policies have failed to solve problems that inhere in the international situation. It is in these circumstances that conferences are taking place at Washington, with the primary object of securing a return by all nations to stable currencies, and the removal of artificial obstacles to world trade recovery.

"The most pressing need at present is the establishment of sound currencies in all countries. It has been admitted by a leading British economist (J. M. Keynes) that the expedient of going off the gold standard 'means the setting into motion of natural forces which are certain in course of time to undermine and eventually destroy the creditor position of the two leading gold countries'. This sapping and undermining process has been definitely checked by the emergency measures instituted by our Government.

"Involved in the protection of our position as a creditor country, is the discussion of the concessions we are willing to make—or rather the sacrifices we are willing to bear—in order to buy off this combination against our foreign trade. I feel I do not speak for myself alone when I say that our national trade interests should be safeguarded against any further exploitation of American generosity.

Protection Not Inconsistent With Cooperation

"If the ultimate end of our national industries is to maintain our population in security and comfort, and to insure the economic security of our nation, we shall view with apprehension any efforts made to deprive our national industries of the protection so essential to the accomplishment of these high purposes. This does not preclude closest cooperation with all countries, in the endeavor to rid world markets of the obstructions that prevent the natural flow of international trade. Our readiness to enter into reciprocal trade arrangements with other countries should not impose upon our country further sacrifices, but should be of a character mutually advantageous."

Relations of Government and Industry

Discussed by Tool Builders

THE thirty-first spring convention of the National Machine Tool Builders' Association held at the Cleveland Hotel, Cleveland, April 23 to 25, centered its attention on the efforts of the Roosevelt administration to bring about a revival of business through various pending or proposed legislative acts. Members of the association indicated that they would cooperate whole-heartedly with the administration in its various efforts to relieve present industrial and economic conditions and start the country back to a period of prosperity. A feeling of optimism prevailed among the members. This evidently was inspired by the belief that the steps that are to be taken in Washington will be in the right direction and provide efficient remedies for the country's economic ills.

A. A. Muller, president and treasurer, King Machine Tool Co., Cincinnati, was formally elected president, which office he has held since the recent retirement of Henry S. Beal. Richard A. Heald, secretary and treasurer, Heald Machine Co., Worcester, Mass., was elected first vice-president to fill the vacancy caused by Mr. Muller's advancement, and H. S. Robinson, secretary and sales manager, Cincinnati Shaper Co., succeeded Mr. Heald as second vice-president. H. M. Lucas, president, Lucas Machine Tool Co., Cleveland, was appointed a director to fill the unexpired term of Mr. Beal.

Sees Optimism Returning

President Muller in his address said that a new set of circumstances, referring to developments in Washington, had raised in the machine tool industry a measure of optimism, and that it is reasonable to assume that the industry will share in the adjustments ahead because of the determination of the Government to put people back to work. The association, he said, should consider some of the possibilities that may arise, and clear its path of some obstacles that members have placed in the way since the machine tool business has been below normal. Practices unfair to their competitors, he declared, have been adopted by some of the manufacturers in their efforts to secure more than their share of business. Machine tool builders joined in the rush to deflate prices and in some cases machine tool prices have tumbled to below the cost of material and labor. Spectacularly low prices at which machine tools have been offered on open bids to Government, State and municipal purchasers, he said, can be regarded in no other light than as free gifts of engineering talent and construction. While no one can know just what lies immediately ahead, the industry can confidently expect some business when

the program of the Washington administration is defined.

The trend toward Government control in business was discussed by Herman H. Lind, manager of the association. Activities long thought of as subject only to individual direction, he said, are rapidly coming under Government control or supervision, although the Government so far has not touched industry directly. During the Hoover administration self-government by the industry itself was advocated. However, the following of sound business practices by the majority in many industries gave the unscrupulous an opportunity to take an unfair advantage. With the present unemployment situation, legislation directed at industry must be expected. "Irrespective of our attitude a few months ago," he said, "it looks as if industry today is faced with the necessity of definitely planning for its welfare and that of its employees or the Government will do its planning for it."

Industry Must Cooperate

It is not only the privilege but the specific duty of industry to coordinate, declared Mr. Lind, and this should be done through its trade associations. The consideration industry has shown toward its workers, its acceptance and promotion of the higher standards of living and its contribution to the public interest give it the right to speak, and the necessities of the situation make it a duty to speak and make plain its ideas as to the conditions which should surround it. However, to be most effective either from the standpoint of ideas themselves or of advancing them, it is essential that they be the result of careful study on the part of industry.

While trade associations have done much, the necessity for their existence and for their becoming forceful has multiplied many fold during recent months. Ideas and plans affecting industry have been presented to the administration in Washington literally by the thousands. However, there is lacking well thought out plans that have been analyzed and coordinated by the various industries. To set up such plans business must study itself as never before. A high degree of cooperation will tend toward cooperative efficiency as opposed to blind individualism. Most businesses have found it necessary to make continuous careful study of their own figures. However, we have now arrived at a period when no one can get a true picture of his own business unless he has alongside it also the picture of the industry. Facts known about competitive industries act as a safeguard.

While times are being faced that are totally different from any that have gone before, the policy of firm

prices, Mr. Lind declared, can stand any analysis or examination. The firm price policy is the only honest policy. He urged that the association and its members bring together all facts that might be used in a Government study, and that industry study and develop its own ideas as to the best plans to be followed for the benefit of industry and its employees in the public interest. The evident determination of the administration, he declared, is to direct and, if need be, control industry for the public good and only a high degree of cooperation can put the machine tool industry in a position where it can assist in guiding the hands of the Government.

Predicts Good Future for Industry

An interesting talk was given by Dexter S. Kimball, dean of the College of Engineering, Cornell University, who took for his subject, "A Policy for the Machine Tool Builder for the Next Ten Years." He stressed the fact that the machine tool industry had enjoyed good times in the past and predicted that it would have prosperous years in the future.

A report of the committee on foreign trade containing a great deal of interesting statistical information was prepared by P. E. Bliss, president, Warner & Swasey Co., Cleveland, and presented by C. S. Stilwell, sales manager of that company. Some information regarding the practices of the Government in buying equipment for the Army and Navy was presented by H. S. Robinson in a paper entitled "Uncle Sam Goes Shopping."

Several round-table group luncheon meetings were held the opening day and various group meetings took place during the afternoon of the closing day. During these each group discussed business developments and some of its own problems.

At a formal dinner meeting, Dr. William E. Wickenden, president, Case School of Applied Science, Cleveland, told of some of the influences on the life of the nation that have resulted from the use of machine tools, including in these the elimination of child labor, the reduction of the proportion of population required for material production and the shifting of workers from blue jeans in mills and factories to the field of service in the white collar class. Large industrial centers were started in the period of steam and water power when the job had to be taken to the power, he said. Now with electric power the power goes to the job and, with the great improvement in transportation, industry may be decentralized. America has the problem of making terms with the machine. The speaker predicted that greater opportunity would be provided for leisure and out of that opportunity there will grow a new idealistic culture. Willard M. Kiplinger, president, Kiplinger Washington Service, spoke on recent and pending developments in Washington.

Bethlehem Steel Reports Large Loss in First Quarter

But Unfilled Orders Increase and Operations Have Risen to 23 Per Cent Rate in Response to Better Business

BETHLEHEM STEEL CORPN. reported an operating loss of \$866,144 in the first quarter, as compared with a loss of \$566,937 in the fourth quarter of 1932 and an operating income of \$1,431,657 in the first quarter of last year. Adding interest charges of \$1,658,381 and \$3,244,926 for depletion and depreciation, the total deficit for the quarter was \$5,769,451.

E. G. Grace, president of the corporation, reported that unfilled orders at the close of the quarter totaled \$38,360,601, as compared with \$30,568,937 at the end of the previous three months and \$35,372,318 on March 31, 1932.

Operations in the first three months of this year averaged 15.8 per cent of capacity, as against 13 per cent in the previous quarter and 23.4 per cent during the first quarter of 1932. Current operations average about 23 per cent.

Mr. Grace found encouragement in the gain in steel bookings that has occurred in the past few weeks. The increase, he said, was due almost entirely to larger orders from can makers, automobile manufacturers and a wide range of miscellaneous buyers. Business from the railroads and the construction industry has remained notably light. Part of the recent improvement, he thought, was due to seasonal influences. Motor car makers and can manufacturers ordinarily expand operations at this time of the year and outdoor activities of various kinds commence, stimulating purchases of wire, bars, sheets and other products. He was of the opinion, however, that the gain in steel bookings was perhaps somewhat greater than seasonal. He noted that jobbers and distributors had been buying further ahead than usual, "having nothing to lose and standing a chance of gaining something if prices advance."

When asked whether economies introduced by his company would make it possible to break even at less than the 40 per cent operation he gave as the minimum a year ago, he said that it was exceedingly difficult to forecast the rate at which deficits would disappear but that price declines in the past 12 months had tended to offset savings achieved through increased efficiency. He knew of no imminent expansion in rail buying and stated that some railroads still had rails in stock which they would have to lay before considering additional orders.

When questioned as to his attitude toward the Black bill, the Perkins

bill and other measures calculated to regulate working hours and wages, he declined to comment, saying that he preferred not to discuss "political" questions. When asked whether a 30-hr. week law would actually provide more employment in steel plants, he replied that a recent survey of the

British Steel Industry Faces Sweeping General Reorganization

A BROAD federation of trade associations is what has been proposed to strengthen the status of the British iron and steel industry. The report of the national committee of the industry, which has been engaged for upward of a year, provides for an Iron and Steel Corp'n. of Great Britain, which shall coordinate a dozen or so of associations, each dealing with a group of products. The corporation is offered to secure the advantages of both combined action and individual enterprise and bring about a balance of interests to the producing and consuming sections of the industry.

The separate associations are not only to cover makers of pig iron and raw steel but to extend to the makers of the lighter products, such as tin plate and wire, and also the steel fabricators. It is stated that the associations will represent a development of existing associations, fewer in number than now, to secure the "progressive concentration of production in the more efficient plants," to eliminate "redundant and inefficient plants by paying compensation" and to promote export trade.

The corporation is not to own or operate any iron or steel works or to have power to interfere with the rights of the individual producer. It will be governed by a council of which nine members would represent producers of iron and steel and 10 represent the various associations. Its functions would include, by agreement with the association, such services as central purchasing, common marketing and research.

To take care of any recalcitrant branch of the industry, there is the following provision: "Assuming all substantial producers of pig iron and ingot steel and a good majority of the manufacturers of secondary products join the proposed corporation, it would be able to exert pressure on any opposing section by suitable rebate schemes. These might

entire industry disclosed that the average working period per man is now only 28 hr. a week. He called attention to the fact that steel companies had led in the sharing-of-work plan and that his corporation could dismiss 25,000 men "tomorrow," if it put its employees on a normal working schedule.

The abandonment of the gold standard was too recent an event, in Mr. Grace's opinion, to have any noticeable effect on foreign trade. If the dollar remains depreciated, the natural assumption is that steel exports will gain. In the meantime the mere fact that dollar exchange is uncertain may restrict foreign shipments of pig iron and steel to this country.

provide, on the one hand, for preferential prices for supplies to members of the corporation, and, on the other, bind purchasers by means of special rebates to take only the products of the corporation."

Besides its coordinating and supervisory functions, the central corporation would take over the work of the National Federation of Iron and Steel Manufacturers, which would then go out of existence. In discussing the reorganization and the demand on the part of consumers for price reductions, *The Engineer*, of London, says: "It is only fair to remember that the steel makers have consistently maintained their view that a serious reduction in prices must follow the reorganization of the industry and cannot precede it."

Japan May Reduce Duties on Iron and Steel

One of the proposals following recent Diet approval of the bill calling for the merger of all private and governmental iron and steel plants in Japan is that as soon as the new merger corporation has been organized and is on a sound financial basis, the import duty on iron and steel products into Japan should be reduced, according to a report to the Commerce Department's Iron and Steel Division from Assistant Commercial Attache William S. Dowd, Tokyo.

This proposal is being supported by importers and consumers in Japan, who wish to see the cost of iron and steel products reduced. The pig iron manufacturers object to the plan, stating that even with the recent 35 per cent increase in tariffs, local market quotations have not risen to a point where they are able to show any substantial net profit. They also expressed belief that pig iron from India would again be introduced into Japan should import duties be lowered.

PERSONALS

C. E. WRIGHT, markets and news editor of THE IRON AGE, has resigned to become connected with the Republic Steel Corp., in its New York office. Associated for 20 years with the Iron Age Publishing Co. and for the past 16 years with THE IRON AGE, Mr. Wright has given special attention to the commercial side of the iron and steel industry, winning recognition as a national authority on market practices. A keen observer of changing trends in trade conditions, he was among the first to appreciate the growing need for market analysis as a means of measuring potential business volume in both new and staple iron and steel products. He early recognized the emergence of scrap to a position of major importance among steel company raw materials. Acting under a commission from the Institute of Scrap Iron and Steel, he made the first national survey of iron and steel scrap consumption. A native of Port Huron, Mich., Mr. Wright engaged in reportorial work on daily newspapers at Detroit, Toledo, Chicago and Minneapolis and later became associated with the Iron Age Publishing Co. as Western editor of the HARDWARE AGE at Chicago. He was subsequently transferred to the main office of that publication in New York, and in 1917 joined the editorial staff of THE IRON AGE. In April, 1930, he was placed in charge of the markets and news departments.

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ERLE L. FLAD, assistant manager of slag sales of Carnegie Steel Co., Pittsburgh, since November, 1930, has been made manager of that department, succeeding W. E. DONALDSON, the appointment being effective May 1. Mr. Flad was graduated from Lafayette College, Easton, Pa., in mining engineering and previous to his Carnegie Steel contacts he was on the engineering corps in the construction of the Panama Canal, and also with the American Smelting & Refining Co. as chemist at its laboratories at Perth Amboy, N. J. In May, 1909, Mr. Flad went to the Ohio works of Carnegie Steel Co. at Youngstown as clerk in the blast furnace department, and later became assistant superintendent of blast furnaces. He was then made superintendent of the slag sales at Youngstown and in 1930 was brought to the Pittsburgh offices.

♦ ♦ ♦

O. J. H. HARTSUFF, general superintendent of Edgar Thomson works, Carnegie Steel Co., Braddock, Pa., resigned and retired from business April 30, after almost 50 years of activity in the steel industry. Mr. Hartsuff was born in New Castle, Pa., studied mechanical engineering and started his business life in 1883



C. E. WRIGHT

as a machinist with the New Castle Wire Nail Co. Later he was associated with the New Castle Wire Rod Co., Shenango Valley Steel Co., and the National Steel Co. Upon the consolidation of the National with Carnegie Steel Co., he was made superintendent of the rolling department at New Castle works and furnaces, then superintendent of the Farrell and also the Sharon works, and subsequently general superintendent of these works until April 1, 1920, when he was made general superintendent at Edgar Thomson.

♦ ♦ ♦

F. D. FOOTE and E. P. BROOKS have been appointed assistants to Charles L. Wood, commercial vice-president of

the United States Steel Corp. Mr. Foote, who was formerly president of the Pittsburgh Forgings Co. and the Greenville Steel Car Co., will be responsible for the coordination of sales efforts affecting the railroads and the railroad equipment industries. Mr. Brooks was formerly of the sales executive staff of Sears, Roebuck & Co. Both will have the title of assistant to the vice-president.

♦ ♦ ♦

WALTER S. AYLSWORTH, 411 Boulevard of the Allies, Pittsburgh, has been appointed representative in the Pittsburgh territory for the C. W. Poe Co., Cleveland, maker of high-pressure heating insulating materials. Mr. Aylsworth has also been named Pittsburgh representative for the Charles Taylor Sons Co., Cincinnati, in the sale of P. B. Sillimanite Super-Refractories and fire clay brick.

♦ ♦ ♦

H. V. ERBEN, who has been identified since 1920 with the General Electric Co., has been appointed manager of the switchgear sales division of the central station department, with headquarters at the West Philadelphia works. He succeeds J. W. UPP, who has retired after 32 years of service with the company, including 26 years as manager of the department. Mr. Upp will continue in an advisory and consulting capacity.

♦ ♦ ♦

EDWARD D. BUCHANAN has been made superintendent of the open-hearth department, Butler, Pa., plant, of the American Rolling Mill Co., Middletown, Ohio. Mr. Buchanan joined the Butler organization before it became a part of the American Rolling Mill Co. as a general foreman in the open-hearth department. Shortly after the Rolling Mill company acquired the Columbia Steel Co., he was appointed assistant open-hearth superintendent.

♦ ♦ ♦

DONALD B. PATTERSON, vice-president, Harnischfeger Corp., Milwaukee, has been elected chairman of the



E. L. FLAD



O. J. H. HARTSUFF



F. D. FOOTE

Electric Hoist Manufacturers' Association, New York, succeeding WILLIAM WHITE, of the Euclid-Armington Corp., Euclid, Ohio. FRANK F. SEAMAN, general manager of the hoist and crane division, Robbins & Myers Sales, Inc., Springfield, Ohio, has been elected vice-chairman.

♦ ♦ ♦

LLOYD D. BRADY, who recently resigned from the Ford Motor Co. after having been identified with the Rouge foundries for seven years, sailed for Europe to undertake an important foundry mission in Italy. He expects to contact the principal foundry centers in Europe before returning to the United States.

♦ ♦ ♦

GEORGE BIRKENSTEIN has been elected president of S. Birkenstein & Sons, Inc., Chicago, succeeding LOUIS BIRKENSTEIN, who has been made chairman of the board. Other officers elected were: Vice-presidents, F. W. HOLLER, J. W. LONG and HARRY BIRKENSTEIN; treasurer, MILTON BIRKENSTEIN, and secretary, ALBERT BIRKENSTEIN.

♦ ♦ ♦

H. ALLEN HALL has been appointed assistant sales manager of the Ferry Cap & Set Screw Co. He has been connected with the company for 15 years calling on the jobbers throughout the East and Middle West, and is well known to the hardware and mill supply trade.

♦ ♦ ♦

C. W. SIMPSON, who for the past six years has been works manager of the Windsor, Vt., plant of the National Acme Co., and who was transferred to Cleveland when the Windsor plant was moved to that city, has been appointed vice-president and works manager of the company. After twelve years' experience with engineering firms in various parts of the country, Mr. Simpson became connected with the Windsor Machine Co. in 1909, and was placed in charge of the automatic department. In 1911 he was sent to Europe as the company's special representative and made his headquarters in England. After the National Acme Co. purchased the Windsor company in 1916, Mr. Simpson was retained as its representative in Europe until 1927 when he was recalled to take over the management of the Windsor factory.

♦ ♦ ♦

A. E. DRISSNER, who has been chief engineer of the National Acme Co., Cleveland, since 1916 when this company took over the Windsor Machine Co., Windsor, Vt., has been appointed vice-president in charge of engineering, following the consolidation of the two plants in Cleveland. After being connected with several machine tool manufacturers in Cincinnati and Cleveland in 1904 and 1905, Mr. Drissner the following year was appointed direct representative in Europe for the Windsor Machine Co., Jones & Lamson Co., Fellows Gear Shaper Co. and LoSwing Co. From

1910 to 1914 he was the European agent of the National Acme Co. with headquarters in France. In 1914 he was recalled to take charge of the engineering department and new design. He was appointed chief engineer of the National Acme Co. in 1916 when that company purchased the Windsor Machine Co.

▲ ▲ OBITUARY ▲ ▲

FRANCIS H. RICHARDS, consulting engineer and inventor, died at a hospital in New Britain, Conn., on April 29, aged 83 years. In recent years he had been consulting engineer and designer for the Pratt & Whitney Co., Hartford, and had hundreds of patents to his credit, among them automatic weighing machines, machine shop tools and appliances, and developments for coke furnaces and door springs. Until a few years ago, Mr. Richards was adviser to several large manufacturing companies, including the Stanley Rule & Level Co., New Britain, and the Cleveland Twist Drill Co., Cleveland. He was one of the founders of the American Society of Mechanical Engineers, which awarded him a medal in 1930 in commemoration of his having been a member for half a century.

♦ ♦ ♦

LE ROY SEIDELL, president of the New York Testing Laboratories, died on April 20 after a long illness.

♦ ♦ ♦

JAMES E. LAWTON, sales manager in the roll department of the Ohio Steel Foundry Co., Lima, Ohio, died on April 25 in a Cleveland hotel. He had formerly been identified with the Wheeling Mold & Foundry Co., Wheeling, W. Va., and with the Mesta Machine Co., West Homestead, Pa.

♦ ♦ ♦

RICHARD J. FINDLAN, secretary and treasurer, Aluminum Goods Mfg. Co., Manitowoc, Wis., died April 22, aged 61 years. He was born in Pittsburgh and at an early age went to work in the steel mills. He later joined the staff of the Aluminum Co. of America and remained 25 years. In 1914, when this company became interested in the Manitowoc company, he was transferred there as a staff executive.

♦ ♦ ♦

GEORGE B. SIMMONS, president of the American Mining Tool Co., Ottumwa, Iowa, and for half a century prominent in industrial activities in Ottumwa, died on April 24 in his home at that city after a long illness, aged 75 years. He began his business career in Ottumwa and organized the American Mining Tool Co. about 26 years ago.

♦ ♦ ♦

PERRY E. CARHART, retired chief inspection engineer of the Illinois Steel Co., died April 22 of pneumonia at the age of 72 years. He was born

at Albany, N. Y., and received his schooling at Union College. He retired 10 years ago, after more than 30 years of engineering service.

Railroad Labor Protests Reorganization Measure

WASHINGTON, May 2.—The railroad reorganization bill is expected to be laid before Congress this week by President Roosevelt. Railroad labor has protested against the measure as sent to the White House on the ground that proposed economies through consolidations of lines, elimination of unnecessary mileage, terminals, etc., and mergers with water, motor and air lines would be at the cost of wage earners. The Railway Labor Executives' Association will present protests of labor at hearings to be held before the Senate Committee on Interstate Commerce of which Senator Dill of Washington is chairman. The first witness, however, will be Joseph B. Eastman, of the Interstate Commerce Commission. Mr. Eastman is widely mentioned as the possible coordinator under the bill. The law would be administered by a new governmental agency, the Transportation Section, in the Department of Commerce, which would take over some of the powers of the Interstate Commerce Commission. It is reported the section will be headed by John Dickinson, present assistant secretary of commerce, and formerly of the University of Pennsylvania faculty.

Once the plans of railroad reorganizations were effected it is believed the carriers, through government support, would enter upon a program of rehabilitation that would involve some important purchases.

Hardware Age Absorbs Good Hardware

Hardware Age, published every other Thursday, will absorb *Good Hardware*, published monthly for the past 12 years by the Trade Division of the Butterick Publishing Co., New York. The combination becomes effective following the May, 1933, issue of *Good Hardware*.

Hardware Age, published by Iron Age Publishing Co., New York, was established in 1855 and is the oldest hardware journal in America.

Colorado Fuel & Iron Co. reports a deficit of \$400,654.40 for the first quarter of 1933 before provision for depreciation and depletion, which brings the total deficit up to \$750,695.12. The company's loss in the first quarter of 1932 was \$42,180.15 and its deficit in that quarter including charges for depreciation and depletion was \$399,278.71.

Early Decision Expected On Public Works Program

WASHINGTON, May 2.—Tentative plans for a public works program contemplate an expenditure of \$1,000,000,000 to \$2,000,000,000 in one year. There is also under consideration an outlay of \$1,000,000,000 for road construction over a period of three years. One-half billion of the latter amount would be spent in the next year.

Outlined by a special committee of the cabinet the proposed draft has been placed before President Roosevelt. Early decision on a definite program is expected to be made. At present it appears to be uncertain whether funds for the projects will be raised by taxation or by a bond issue.

The public works program as

mapped out includes public buildings, naval construction, rivers and harbors improvements and other developments of an internal nature. Especial attention is reported to have been given to the inclusion of so called self-liquidating projects. Actual naming of the projects under the contemplated legislation, which it was reported likely would go to Congress within a week, would be in the hands of the President and a special committee. It would mark further the power granted the President to assume control of management over governmental operations. The program is designed to be a part of the multiple moves of the administration to increase employment, stimulate industry, and generally to hasten economic recovery.

No details have been given out. It is not possible therefore to say how the proposed expenditures would be divided. They fall well below in the amount which had been previously discussed in some official quarters. The scaling down is reported to have been due to protests from the Secretary of the Treasury and the Director of the Budget.

The set-up is understood to provide for a coordinator or national board to have charge of the work. At the insistence of President Roosevelt, it is said public works would cover self-liquidating projects especially and would provide the greatest amount of employment. With the end in view also of increasing employment it is said that consideration is being given to legislation that would give still further wide authority to the President permitting suspension of the anti-trust laws. This, it is said, would fit in with the provisions of the Black 30-hr. bill, though it was not made definitely clear that this is so.

Tools Institute Elects Officers

The American Machinery and Tool Institute, at its annual meeting held in Chicago, April 26, elected the following officers and directors: President, E. R. Prout, Teletype Corp.; vice-president, Frank Quick, Management Service Co.; treasurer, Craig B. Hazelwood, First National Bank, Chicago; secretary, George R. Tuthill, 40 North Wells Street, Chicago; directors, W. R. Mau, Vanadium Alloys Steel Co.; J. S. Kosacka, Lewis Institute; F. B. Coyle, International Nickel Co., Inc.; S. B. McHenry, William D. Gibson Co., and A. C. Wais, Niles Tool Works Co.

ever, that the increased bookings in March were largely due to a few semi-public projects financed by the Reconstruction Finance Corp. The order to stop all public works, which was recently issued from Washington, came too late to show its effect in the March total. The institute's comment is that "while the figures indicate a slight improvement for the month, it would be incorrect to ascribe them as a trend"

A complete tabulation of the reports is shown below.

National Industry Act Hits Snag

WASHINGTON, May 2.—The attitude of Secretary of Commerce Roper indicates that there is no likelihood of the passage by Congress of the National Industry act sponsored by the National Association of Manufacturers and laid before Mr. Roper for study. Mr. Roper indicated that the measure would be a substitute for the administration plan of industrial control through amendments of Miss Frances Perkins, Secretary of Labor, to the Black 30-hr. bill. For this rea-

son, Mr. Roper expressed the opinion that the bill of the National Association of Manufacturers would not make any headway. Mr. Roper promised to study the measure, however, and said that if he found it contained sufficient merit he would place it before President Roosevelt. Dr. Raymond Moley, Assistant Secretary of State, formerly of Columbia University, has previously studied the measure.

According to Mr. Roper, the bill would provide for complete control of industry through a board of seven members headed by the Secretary of Commerce and the Secretary of Labor, with the five other members representing labor, commerce, finance, agriculture and the public. For the purpose of balancing production and demand, stabilizing markets and establishing prices at fair levels, industrial and trade associations would cooperate with the national board. Plans would be pushed also for a vast public works program. The set-up would largely parallel the War Industries Board. Plans are also in contemplation by the association for urging revival of the National Defense Council.

Fabricated Structural Steel Gained in March

Fabricated structural steel bookings in March totaled 71,398 tons, compared with 50,965 tons in February and 73,679 tons in January, according to the monthly report of the American Institute of Steel Construction. This organization explains, how-

Slight Decline in March Steel Casting Orders

WASHINGTON, May 2.—Making a decline of 399 tons, orders for commercial steel castings in March totaled 11,458 tons compared with 11,857 tons in February, according to reports received by the Bureau of the Census from 130 establishments. The March bookings consisted of 2784 tons of railroad castings and 8674 tons of miscellaneous castings. Production in March rose to 13,209 tons from 12,438 tons in February.

	Fourth Quarter (1932) Average per Month	*January, 1933	*February, 1933	March, 1933
Number of companies reporting	150	169	182	171
Tonnage booked	63,203	73,679	50,965	71,398
Tonnage shipped	59,134	50,955	46,168	54,948
Tonnage on hand for future fabrication—				
Companies reported	(73)119,107	(88)174,375	(87)285,853	(81)300,931
Companies reporting no work ahead	43	48	60	57
Companies making no report on work ahead	34	33	35	33
Percentage of industry reporting—per cent	73	84	83	82

*Revised.

• • EDITORIAL COMMENT • •

Reassuring Hesitation . . .

INDUSTRY will be heartened, if, as it is reliably reported, the President has considered it wise to omit the 30-hr. week bill from the present emergency program.

It was not a practical proposal and its enlargement by the Secretary of Labor made it even less so. As proposed, it would have set up a bureaucratic industrial commissariat of seven with dictatorial power over such a vast and complicated minutia of intricate economic relationships as to inevitably cause industrial and business stagnation if attempted.

For example, if 30-hr. American labor had to compete with 60-hr. foreign labor, without import restrictions, this country would obtain no benefit whatever from price rises, even with minimum wages established, for we would be flooded with cheap foreign goods. On the other hand, if the 30-hr. restriction were applied to imports (an impractical suggestion from the mere standpoint of checking the facts), imports would be practically prohibited and the President's plans to develop trade agreements would be completely nullified.

Industry does need regulation. It needs a practical means to do away with cutthroat and ruinous price competition which drives wages lower and lower. It probably needs a restriction on new capacity in certain lines for some time to come. It needs a limitation of working hours in particular cases.

This regulation, to be practical and successful, can come only from industry itself, brought about by the men who are familiar with its many problems, along such lines as have been suggested by the National Association of Manufacturers. The trade association in each specific industry must be the nucleus of its control. The Government can do its part, not by erecting a "supreme council of seven," but by liberalizing the "restraint of trade" laws so that men of good purpose can plan together without going to jail, and by providing the necessary "teeth" so that trade bodies may purge their industries of the few unprincipled pirates who cause most of our troubles.

The President is well advised. His action in holding up the 30-hr. week bill will add to the confidence now being engendered by increasing business volumes.

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Shippers See Coming Improvement . . .

TWENTY THOUSAND shippers expect an increase in car loadings in the second quarter of 1933, according to a recent report of the Shippers' Advisory Boards. Each of the 13 regional boards prepares in advance quarterly car loading estimates covering 29 principal commodities and intended primarily for the guidance of railroad operation. The reports are impersonal and collectively form an expression of the best judgment of shippers in close touch with the pulse of industry.

Shippers located in four regions, the Mid-west, Ohio Valley, Allegheny, and Southeastern territories, expect an

increase in car loadings in the second quarter of this year as against car loadings for the second quarter of 1932. For the Mid-west territory the expected increase amounts to 16.2 per cent. The Ohio Valley district looks for a 10.4 per cent increase, whereas the Allegheny and the Southeastern territories expect increases of 3.1 per cent and 0.4 per cent respectively. Decreases as against 1932 are anticipated by several districts, but the total car loadings expected for the second quarter of 1933 in all the regions comes to approximately the same total representing the actual shipments in the second quarter of 1932.

This is the most favorable forecast to be presented by the Shippers' Advisory Boards for any quarter since the fourth quarter of 1929.

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British Preparing For the Race . . .

FOR some years signs have pointed to a progressive integration of the British steel industry. The forthcoming report of the national committee organized to study conditions under the headship of Chairman Mitchell of Dorman, Long & Co., Ltd., is expected to emphasize the fact, and anticipating this comes news of the likely amalgamation of the Dorman-Long and the South Durham companies. Presumably the movement will mean further mergers of strategically positioned plants and the abandonment of some rerollers or transformers, as the steel makers who start with semi-finished steel are called in Europe.

There is recognition for one thing that family-owned properties must give way to more broadly cooperative enterprises, for the sake of effecting manufacturing economies, but also there is a disposition to provide for the reroller. The rerolling mill for years prior to the war and since then has been able to import to his advantage Continental semi-finished steel and thereby remain able to sell his products in the world's markets. The recommendation of the committee will undoubtedly look to improving the status of the industry as a whole. And in all this, increased empire cooperation is counted on, such as crystallized at the Ottawa conference last fall with its preferential tariffs to encourage a full interchange of products among the countries constituting the empire.

England is hopeful of the future, judging from recent remarks of Sir William J. Larke, director of the national organization of steel manufacturers. Sir William feels sure that there has been no approach to a saturation of the markets for iron and steel, and he does not lose sight of the relatively good showing the British industry made in 1932 as compared with the rest of the steel-producing countries. It is, of course, difficult to believe that in the long run there will not be strong demands for steel for buildings, and for all means of transport—on the water, on the land and in the air—and for steel to enter into the myriad of things required by the factory, farm and fireside. Steel producers the world over have that prospect and Great Britain should certainly get its share.

Pig Iron Daily Output Gained 18.8 Per Cent in April

APRIL production of coke pig iron totaled 623,618 gross tons against 542,011 tons in March. The April daily rate, at 20,787 tons, went up 18.8 per cent from the March rate of 17,484 tons daily. There has been no monthly gain approaching this since last September, which showed an increase of 15.4 per cent over August.

There were 48 furnaces in operation on May 1, making iron at the rate of 22,805 tons daily, compared with 38 on April 1, with a daily operating rate of 15,580 tons. Eleven furnaces were blown in and one taken off blast, making a net gain of 10 furnaces. The Steel Corporation blew in five furnaces and took one off. Independent steel companies blew in four furnaces, and merchant producers put two furnaces in.

Among the furnaces blown in are the following: A Carrie, an Ohio and a Mingo furnace of the Carnegie Steel Co.; a Gary and a South Chicago furnace of the Illinois Steel Co.; a Donner, a Hazelton and the Trumbull-Cliffs furnace of the Republic Steel Corp.; one River furnace, Corrigan, McKinney Steel Co.; the Neville Island unit of the Davison Coal & Coke Co. and the Rockdale furnace of the Tennessee Products Corp. The unit blown out was a Central furnace of the American Steel & Wire Co.

Production of Coke Pig Iron and Ferromanganese

	Gross Tons Pig Iron*		Ferromanganese†	
	1933	1932	1933	1932
January	568,785	972,784	8,810	11,250
February	554,330	964,280	8,591	4,010
March	542,011	967,235	4,783	4,900
April	623,618	852,897	5,857	481
May		783,554		5,219
June		628,064		7,702
½ year.....		5,168,814		33,562
July		572,296		2,299
August		530,576		3,414
September		592,589		2,212
October		644,808		2,302
November		631,280		5,746
December		546,080		7,807
Year		8,686,443		57,342

*These totals do not include charcoal pig iron. The 1932 production of this iron was 15,055 gross tons.
†Included in pig iron figures.

Canadian Outlook is Thought to Be Improving

TORONTO, May 1.—While there has been no direct improvement in business or plant operations in the Canadian iron and steel industry, a better undertone has appeared, and officials of various companies are of the opinion that concrete evidence of better conditions is at hand. The world economic conference is cited as the forerunner of better times which will be brought about through the medium of inflation. Recently there has been a noticeable upswing in commodity prices and as these tend to go higher, it is believed that new buying will appear and there will be a more concerted tendency to replace depleted stock supplies.

So far, however, the United States seems to have the edge on the road to improvement. The mining industry is the one real bright spot in industry and is furnishing its quota of new business to other industries, including iron, steel and machinery trades. Some minor improvement also has appeared in a few other lines, but so far have not been reflected in plant operations.

Pig Iron

In this market there was a slight gain in sales during the past week or 10 days. No future delivery business has been closed and no inquiries are out. It is expected, however, that the starting of Great Lakes navigation will stimulate the movement of pig iron to melters in this province. Pig iron production is at a standstill, but

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons)		May 1		April 1	
	April (30 Days)	March (31 Days)	Number in Blast	Operating Rate, Tons a Day	Number in Blast	Operating Rate, Tons a Day
New York:						
Buffalo	15,553	15,294	2	710	1	495
Other New York and Mass. ....	.....	.....	0	.....	0	.....
Pennsylvania:						
Lehigh Valley	17,695	18,265	2	590	2	590
Schuylkill Valley ...	12,743	13,931	1	425	1	450
Susquehanna and Lebanon Valleys ..	.....	.....	0	.....	0	.....
Ferro. and Spiegel	2,923	2,575	1	95	1	85
Pittsburgh District..	95,956	84,894	8	3,385	6	2,410
Ferro. and Spiegel	2,184	2,203	1	70	1	70
Shenango Valley....	16,348	9,961	1	545	1	320
Western Pa.	12,910	15,429	1	430	1	495
Ferro. and Spiegel	.....	.....	0	.....	0	.....
Maryland	39,592	30,923	2	1,320	2	1,000
Wheeling District.....	80,411	66,178	4	2,750	3	1,620
Ohio:						
Mahoning Valley....	60,722	32,563	5	2,715	2	685
Central and Northern	83,034	71,178	5	2,685	5	2,135
Southern	24,478	26,472	2	815	2	855
Illinois and Indiana...	95,820	95,849	7	4,140	5	2,560
Mich., Wis. and Minn...	13,635	11,987	1	455	1	385
Colo., Mo. and Utah...	17,888	16,521	2	595	2	530
The South:						
Virginia .....	.....	.....	0	.....	0	.....
Kentucky .....	.....	.....	0	.....	0	.....
Alabama	30,976	27,783	2	1,030	2	895
Ferromanganese ..	.....	.....	0	.....	0	.....
Tennessee	750	.....	1	50	0	.....
Total	623,618	542,011	48	22,805	38	15,580

Daily Average Production of Coke Pig Iron

	Gross Tons		
	1933	1932	1931
January	18,348	31,380	55,299
February	19,798	33,251	60,950
March	17,484	31,201	65,556
April	20,787	28,430	67,317
May		25,276	64,325
June		20,935	54,621
½ year.....		28,412	61,356
July		18,461	47,201
August		17,115	41,308
September		19,753	38,964
October		20,800	37,848
November		21,042	36,782
December		17,615	31,625
Year		23,733	50,069

Merchant Iron Made, Daily Rate

1933	Tons	1932	Tons
January	2,602	January	6,256
February	2,863	February	7,251
March	2,412	March	7,157
April	1,908	April	5,287
May	.....	May	4,658
June	.....	June	6,090
July	.....	July	3,329
August	.....	August	3,070
September	.....	September	3,213
October	.....	October	4,286
November	.....	November	4,435
December	.....	December	3,674

producers are carrying large stocks. Imports are in light tonnages and special grades. Local blast furnace representatives report no change in prices, but point out that they are still selling under those quoted by American producers shipping into the Canadian markets.

Scrap

While there are some bright spots in this market, new business generally is of small tonnage and confined to special grades. Steel scrap is at a standstill in the local market with no shipments going forward to the Hamilton district. Montreal dealers, however, are said to be preparing to make shipments to Great Britain. Current demand runs almost exclusively to iron scrap.

SUMMARY OF THE WEEK'S BUSINESS

Steel Production Makes Further Gain; Pig Iron Output in Sharp Upturn

Ingot Rate Rises to 29 Per Cent—April Pig Iron Production in 18.8 Per Cent Gain—Price Advances in Scrap, Sheets and Strip Steel

MOUNTING production, rising prices and broadening demand characterize the iron and steel industry. Factors contributing to current expansion of business include seasonal influences, the release of requirements that accumulated during the bank holiday, and protective buying, prompted by the fear of monetary inflation.

The widespread belief that prices are definitely headed upward has resulted in a general resort to precautionary tactics which, in some cases, verge on speculative activity. The scrap trade, for example, is showing increasing reluctance to sell, holding its material for further advances. The rising tendency of scrap prices is nationwide. Advances in heavy melting grade at Pittsburgh and Chicago have raised THE IRON AGE scrap composite from \$8.83 to \$9.42, the highest level since May, 1931. Pig iron is also gathering strength, an advance of 50c. a ton on Valley basic iron having elevated THE IRON AGE composite from \$14.01 to \$14.10 a ton, the highest figure since May of last year.

The strengthening position of primary materials is paralleled by the buoyancy of finished steel prices. Advances of \$2 a ton on hot-rolled sheets and hot-rolled strip and \$3 a ton on cold-rolled sheets have just been put into effect, having been preceded by widespread covering of second quarter needs at previous quotations. The trend in iron and steel may soon be reflected in higher prices on manufactured consumer products. The possibility that increased material costs may soon force an upward revision in automobile prices is already having its influence on motor car demand. Automobile production for April, estimated at 160,000 to 170,000 units, is expected to be equaled or exceeded in May.

Motor car requirements, together with tin plate buying and a broadening demand from miscellaneous sources, account in the main for current expansion of steel production. Ingot output is now 29 per cent of capacity as against 25 per cent a week ago, increases having been reported in the Chicago, Pittsburgh, Buffalo, eastern Pennsylvania, southern Ohio, Wheeling and Valley districts.

PIG IRON production in April rebounded sharply from the low level reached under the influence of the bank holiday. Whereas March output registered a decline of 11.7 per cent from that of February, April production, in terms of the daily average, rose 18.8 per cent. No monthly gain has approached this since

last September, which showed an increase of 15.4 per cent over August.

Total output in April was 623,618 gross tons, compared with 542,011 tons in March. The April daily rate was 20,787 tons as against the March average of 17,484 tons. There was a net gain of 10 active furnaces during the month, 48 stacks being in operation on May 1 at a rate of 22,805 tons a day.

THE steel industry still lacks the support of building construction. However, structural steel lettings of the week, swelled by a single award of 120,000 tons for the superstructure of a San Francisco bridge, aggregate 126,135 tons, the largest total since the last week of October, 1931. New projects call for 24,100 tons, of which 22,000 tons is for the substructure and anchorages of the San Francisco bridge.

Tin mills continue to be the most active among finishing units in the steel industry. Tin plate output as a whole has increased to 55 per cent from 50 per cent of capacity a week ago. Two or three large producers are fully engaged and several are operating at 75 per cent of capacity.

Sheet mills are getting support not only from the automobile trade but from makers of electric refrigerators and steel barrels, and other relatively small consuming groups.

REPLENISHMENT buying by jobbers has also been a factor in the recent expansion of demand. To what extent such buying represents the building up of badly depleted stocks as opposed to outright expansion of inventory in anticipation of higher prices it is difficult to say. Steel producers, however, are inclined to discourage speculative buying. In few instances have they protected customers beyond June 30. With primary materials showing pronounced strength, they face the prospect of higher costs, which would make heavy extended commitments at present prices hazardous.

Railroad buying, notwithstanding encouraging gains in traffic, is likely to be deferred until agreement is reached on a rehabilitation program at Washington. The rail mill in the Pittsburgh district has been shut down after a brief run and rail output in the Chicago district is being held at a low rate in the hope that new business will develop.

THE IRON AGE finished steel composite price is unchanged at 1.867c. a lb.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:

	May 2, 1933	Apr. 25, 1933	Apr. 4, 1933	May 3, 1932
No. 2 fdy., Philadelphia.....	\$14.34	\$14.34	\$14.34	\$14.84
No. 2, Valley furnace.....	14.50	14.50	14.50	15.00
No. 2 Southern, Cin'tl.....	15.82	15.82	13.82	13.82
No. 2, Birmingham.....	12.00	12.00	11.00	11.00
No. 2 foundry, Chicago*.....	15.50	15.50	15.50	16.00
Basic, del'd eastern Pa.....	14.09	14.09	14.09	16.00
Basic, Valley furnace.....	14.00	13.50	13.50	14.50
Valley Bessemer, del'd P'gh..	16.89	16.89	16.89	17.39
Malleable, Chicago*.....	15.50	15.50	15.50	16.00
Malleable, Valley.....	14.50	14.50	14.50	15.50
L. S. charcoal, Chicago.....	23.17	23.17	23.17	23.17
Ferromanganese, seab'd car- lots	68.00	68.00	68.00	75.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:

Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	27.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	27.00
Forging billets, Pittsburgh..	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb..	1.66	1.60	1.60	1.60

Finished Steel

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Bars, Chicago.....	1.70	1.70	1.70	1.70
Bars, Cleveland.....	1.65	1.65	1.65	1.65
Bars, New York.....	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh.....	1.50	1.50	1.60	1.60
Tank plates, Chicago.....	1.70	1.70	1.70	1.70
Tank plates, New York.....	1.598	1.598	1.598	1.898
Structural shapes, P'gh.....	1.60	1.60	1.60	1.60
Structural shapes, Chicago..	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, P'gh.....	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh.	1.45	1.45	1.45	1.40
Cold-rolled strips, Pittsburgh	1.80	1.80	1.80	2.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Finished Steel

Per Lb. to Large Buyers:

	May 2, 1933	Apr. 25, 1933	Apr. 4, 1933	May 3, 1932
	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.00	2.00	2.00	2.20
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.10	2.10	2.10	2.30
Sheets, galv., No. 24, P'gh...	2.70	2.70	2.60	2.85
Sheets, galv., No. 24, Chicago dist. mill.....	2.80	2.80	2.70	2.95
Hot-rolled sheets, No. 10, Pittsburgh	1.40	1.40	1.40	1.55
Hot-rolled sheets, No. 10, Chi- cago dist. mill.....	1.50	1.50	1.50	1.65
Wire nails, Pittsburgh.....	1.85	1.85	1.85	1.95
Wire nails, Chicago dist. mill	1.90	1.90	1.90	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill	2.15	2.15	2.15	2.25
Barbed wire, galv., P'gh....	2.35	2.35	2.35	2.60
Barbed wire, galv., Chicago dist. mill.....	2.40	2.40	2.40	2.65
Tin plate, 100 lb. box, P'gh.	\$4.25	\$4.25	\$4.25	\$4.75

Old Material

Per Gross Ton:

Heavy melting steel, P'gh..	\$11.75	\$10.50	\$9.25	\$9.75
Heavy melting steel, Phila..	8.25	8.25	6.75	6.50
Heavy melting steel, Ch'go...	8.25	7.75	5.25	6.62½
Carwheels, Chicago.....	8.50	8.25	8.00	6.50
Carwheels, Philadelphia.....	9.75	9.00	8.50	8.50
No. 1 cast, Pittsburgh.....	10.00	9.50	9.00	9.25
No. 1 cast, Philadelphia....	10.25	8.00	8.00	8.50
No. 1 cast, Ch'go (net ton)..	8.00	8.00	6.75	6.50
No. 1 RR. wrot., Phila.....	10.75	8.00	7.50	8.50
No. 1 RR. wrot., Ch'go (net)	6.00	6.00	4.50	4.25

Coke, Connellsville

Per Net Ton at Oven:

Furnace coke, prompt.....	\$1.75	\$1.75	\$1.75	\$2.25
Foundry coke, prompt.....	2.50	2.50	2.50	3.50

Metals

Per Lb. to Large Buyers:

	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	6.25	6.00	4.75	5.50
Lake copper, New York.....	6.50	6.25	5.00	5.87½
Tin (Straits), New York.....	32.50	30.25	24.90	20.40
Zinc, East St. Louis.....	3.75	3.70	3.00	2.55
Zinc, New York.....	4.12	4.07	3.37	2.92
Lead, St. Louis.....	3.37½	3.37½	2.87½	2.90
Lead, New York.....	3.50	3.50	3.00	3.00
Antimony (Asiatic), N. Y....	6.25	6.12½	5.80	5.35

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

May 2, 1933
One week ago
One month ago
One year ago

1.867c. a Lb.
1.867c.
1.879c.
1.970c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.

	High	Low
1933	1.948c., Jan. 3;	1.867c., Apr. 18
1932	1.977c., Oct. 4;	1.926c., Feb. 2
1931	2.037c., Jan. 13;	1.945c., Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29
1928	2.286c., Dec. 11;	2.217c., July 17
1927	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$14.10 a Gross Ton
14.01
13.68
14.22

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
\$14.10, May 2;	\$13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$9.42 a Gross Ton
8.83
7.08
7.62

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low
\$9.42, May 2;	\$6.75, Jan. 3	
8.50, Jan. 12;	6.42, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 22	

Pittsburgh Steel Market Gaining in Strength

Rising Prices, Increasing Production and Heavier Buying Add
Impetus to Cumulative Growth of Demand

PITTSBURGH, May 2.—Supported by price advances in some products and intimation of higher quotations on others, demand for finished steel products, particularly of the lighter sort, has continued to increase sharply in this district. On the other hand, releases for heavier material, such as rail, shapes, plates and pipe, have shown only limited improvement. With inflation of at least a mild sort now definitely assured, steel buyers generally are seeking to cover their requirements for the current quarter, and in most cases this has been accomplished. Under the circumstances, price advances made last week and those which may come will not affect second quarter shipments, but the strong stand made by producers in refusing to take contracts beyond July 1 would indicate a generally higher level in the last half of the year.

Automotive demand for bars, sheets and strip steel continues, and jobbers of steel products are increasing their takings to a marked extent. Manufacturers of electric refrigerators, steel barrels and many other relatively small consuming groups are likewise taking out small lots of steel more freely. The railroads are still deferring purchases in anticipation of a rehabilitation plan from Washington, and movement of reinforcing bars and structural steel is depressed by lack of Federal activity. Nevertheless, award of 120,000 tons of structural steel and 21,000 tons of wire for the San Francisco-Oakland bridge to a Steel Corporation subsidiary has greatly improved backlogs.

The pipe business still is very dull, and demand for plates is rather quiet, although barge building prospects seem unusually good.

Pittsburgh district steel ingot production, influenced adversely by conclusion of a brief run by the local rail mill, has gained only a point this week, and may be estimated at 20 per cent of capacity. Some of the smaller independents are running at a higher rate, but predominance of heavy products in the territory holds down output.

In the Valleys and nearby northern Ohio plants production has risen to 28 per cent, with one large independent interest engaged at a much higher rate. In the Wheeling territory, with heavy support from sheet, strip and tin mills, open-hearth capacity this week is engaged at 65 per cent, the highest rate for the country. In the Pittsburgh district a merchant blast furnace has gone into blast, but a

steel-making stack is scheduled to be banked in the next week.

Finishing mills schedules reflect slight gains in practically all products except rails. The leading structural mill in the district is again active, and bar mill activity has risen over the 25 per cent level. Tin mills are running at 55 per cent, and sheet production is bettering 30 per cent. Price changes during the week have been featured by advances of \$2 and \$3 a ton in sheets and hot-rolled strip. In all cases consumers were allowed to cover at the old levels for the remainder of the quarter. The prospect of higher asking prices on other finished steel products is vague, but important changes are unlikely. Pig iron prices are strong, and scrap quotations have risen \$1 to \$1.50 a ton on the basis of purchases by several consumers in both the Pittsburgh and Youngstown districts.

Pig Iron

Small orders from foundries in the district have shown some improvement in the last week, and shipments are slightly heavier. In all cases sales are being made at the full quoted prices, and quotations are stronger than they have been for some time. The A. M. Byers Co. has not closed against its inquiry for Bessemer iron, and the Edgewater Steel Co. is reported to have postponed further its purchase of basic. The Neville Island furnace of the Davison Coke & Iron Co. resumed production on April 29.

Ferroalloys

The spot price of ferromanganese has been advanced to \$68 a ton where it stood prior to the \$7 reduction several weeks ago, occasioned by foreign competition. Shipments of both ferromanganese and speiseisen have increased in the last fortnight.

Rails and Track Accessories

The market has been unusually quiet in the last week, although negotiations are being carried on quietly by several roads looking toward a trade of scrap for rails and accessories. Specifications for small lots of track supplies are heavier, but no additional rail tonnage has been booked, and the local mill has completed a brief run. Further railroad purchases will likely be deferred until a definite program for the carriers is announced from Washington.

Semi-Finished Steel

Shipments to non-integrated makers of sheets, strips and tin plate are considerably higher, but little new buy-

ing is reported. Most consumers are apparently successful in quietly extending their contracts as they run out. The price on billets, slabs and sheet bars is well sustained at \$26, Pittsburgh or Youngstown, and has been given support by higher prices on sheets and strip. Forging billets are moving in better volume, with the price firm at \$31, Pittsburgh. Not much change is reported in the movement of wire rods, although the price is holding at \$35, Pittsburgh.

Bolts, Nuts and Rivets

Shipments to the automotive industry are heavier, but other large consumers have not increased their requirements. Specifications for bolts and nuts are larger than they were in March, but gains have not been sufficient to advance production schedules materially.

Bars, Plates and Shapes

Merchant and alloy steel bars are in growing demand, but plates, shapes and reinforcing bars continue rather quiet. Lack of Federal projects is naturally a depressing influence on fabricated structural steel and reinforcing bar markets, but small private jobs are more numerous, and there is a fair demand for bars and shapes for warehouse stocks. Deferred purchases by the railroads have influenced plate demand adversely and no new barge buying is reported. The Marietta Mfg. Co., Point Pleasant, W. Va., was low bidder on two large dredges for the United States Engineer at Memphis, Tenn., which will require 1500 tons of plates. A number of private companies are considering the purchase of barges, but existing commercial barge lines are making a strong bid for such business.

Contracts for the superstructures on the San Francisco-Oakland bridge have been awarded to the Columbia Steel Co., San Francisco. Approximately 120,000 tons of structural steel will be required, which will likely be rolled at the Gary, Ind., and Homestead, Pa., works of the United States Steel Corp. and fabricated at the plants of the American Bridge Co. at Gary and Ambridge, Pa. It will probably be two years before the job reaches a point at which structural erection can begin. Four contracts for sub-structures and anchorages have also been let to Pacific Coast contractors, who will require 22,200 tons of steel.

Bar and shape prices are well held in this district, but there is still some shading of the 1.60c., Pittsburgh, price on plates. Reinforcing bars in cut lengths are now quoted at 1.55c. at Pittsburgh, Chicago, Cleveland, Buffalo and Birmingham. On mill lengths the distributors' price carries the usual \$3 a ton differential.

Cold-Finished Steel Bars

Demand is expanding gradually, and sustained schedules in the automotive industry indicate a movement to that source in May fully equal to

April. Small jobbers are building up their stocks slightly, but the less substantial manufacturing consumers are still buying only for their immediate needs. The base price is well maintained at 1.70c., Pittsburgh.

Tubular Goods

Standard butt-weld pipe is still moving to jobbers at a good rate, but demand for other types of tubular goods is quiet. Scarcely any activity is reported in oil country goods, although mechanical tubing and boiler tubes are making a comparatively good showing. Line pipe is dormant.

Wire Products

Merchant wire products are still fairly active, and there is a good demand for manufacturers' wire from the automotive industry. Spring wire continues rather quiet. Little speculative demand from jobbers is reported, and mills are unwilling to take contracts for a longer period than the current quarter. Prices of both nails and manufacturers' wire are well sustained.

Sheets

Increased prices on both cold-rolled and hot-rolled sheets announced by leading producers last week resulted in the heaviest bookings in more than a year. Makers would take orders only for the present quarter, and higher prices now apply on all spot business. Hot-rolled annealed sheets, No. 24 gage, are now quoted at 2.10c., Pittsburgh, and light cold-rolled, No. 20 gage, at 2.45c., representing advances of \$2 and \$3 a ton, respectively. Ordinary hot-rolled sheets were also advanced \$2 a ton to 1.50c., Pittsburgh. Orders from the automotive industry are still holding up, but demand is growing more diversified, with makers of refrigerators, steel barrels and steel furniture stepping up their requirements. Production this week will average slightly over 30 per cent of capacity. The Allegheny Steel Co., Brackenridge, Pa., has booked 700 tons of deoxidized sheets for Pennsylvania license plates. The price was 2.416c. a lb., delivered.

Tin Plate

Specifications continue to gain, and production in the industry as a whole averages fully 55 per cent this week. Two or three large producers have been engaged at capacity, and several others are running at about 75 per cent. Shipments are also increasing, and manufacturers' stocks are being reduced.

Strip Steel

Makers of hot-rolled strip in this and nearby districts have advanced the spot price of \$2 a ton to 1.55c., Pittsburgh. The new price applies only on second quarter business, but many consumers were given an opportunity to cover for that period at the old price before the advance became effective. No change in prices on cold-rolled strip has been announced, and efforts to stabilize the current quota-

tion are being continued. Demand for both hot and cold-rolled strip is well sustained, and production averages about 30 per cent of capacity. Automotive orders predominate, but more diversified demand from small consumers is reported.

Coal and Coke

Shipments of foundry coke are gaining, but the furnace grade is very quiet. Production in the Connellsville region is still declining, as by-product producers are actively competing for any available tonnage. Efforts to stabilize coal prices in this district are going forward.

Scrap

Sales of No. 1 heavy melting steel to at least three consumers at \$12, and even higher quotations on the

current railroad lists, have advanced the market sharply in the last week. Dealers are making sales reluctantly and in most cases orders have been comparatively small. Scrap consumption has risen so much more rapidly than offerings have appeared in the last month, that the market is extremely tight, with the possibility of higher quotations if substantial mill buying appears. The other grades have generally risen in sympathy with steel, and hydraulic compressed sheets from the Michigan territory are practically unavailable in this district. No. 2 steel is in heavy demand by dealers, who are paying \$10 freely to cover. Railroad specialties have been sold at \$13. The Pennsylvania Railroad list, closing on May 3, contains 16,000 tons, including 2260 tons of heavy melting steel.

Boston Scrap Market Showing Signs of Life

BOSTON, May 2.—The scrap market, for the first time in about two years, is showing signs of life. A moderate tonnage for Pennsylvania and New England consumption was moved the past week, with a fairly wide variety of materials involved. No. 1 heavy melting steel, scrap T rails, machine shop turnings, long bundled skeleton and shafting have advanced a little in price. No. 2 steel has been sold at \$3.25 to \$3.50 a ton, on cars shipping point. The supply of textile cast is so large that this material no longer commands a premium over No. 1 machinery cast. About the only materials not moving

are forge flashings, blast furnace scrap and forge scrap. A round tonnage, principally automobile blocks and automobile parts, left here the past week for Gdingen, Poland, via Providence, R. I., where a similar tonnage was taken aboard.

Pig iron sales have fallen off, having amounted to less than 1000 tons in the week. There are no open inquiries in the market, except one for 300 tons from a New Jersey melter for fourth quarter delivery. Two or three nearby foundries are quietly negotiating for iron, however. Prices for domestic iron are firmly maintained. Indian iron has been advanced 50c. to \$1 a ton, depending on freight rate, and is now not less than \$15.50 a ton on dock here, duty paid, and generally \$16.

Trade Notes

Rockford Electric Equipment Co., 720 South Wyman Street, Rockford, Ill., has been organized to buy, sell, repair and exchange electrical and power apparatus of all kinds. Officers and personnel are: A. J. Rund, president; S. J. Beishir, vice-president; D. T. Dwyer, secretary-treasurer; P. H. Donohoe, electrical engineer; and W. Smith, A. Crettol and W. Roos.

Philipp Brothers, Inc., ores and metals, has removed its offices to Cities Service Building, 70 Pine Street, New York.

Homestead Valve Mfg. Co., Inc., Coraopolis, Pa., has appointed C. Kirk Hillman Co., 3201 First Street, Seattle, as its exclusive representative in Washington for the sale of vapor spray machines.

Superheater Co. has moved its Pittsburgh office to American Bank Building, 600 Grant Street. R. L. Ehmman remains in charge of sales of superheaters for stationary boilers, separately fired superheaters and other heat exchange apparatus for stationary power plants.

Charles Colpe, Colpe Investment Co., Russ Building, San Francisco, is planning two-story addition to bottling plant at Sacramento, Cal. Cost about \$50,000 with equipment.

McClintic-Marshall Corp. has moved its New York offices from 39 Broadway to 25 Broadway, the building in which the New York offices of the parent company, Bethlehem Steel Corp., are located.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., has moved its Philadelphia

office to the Niles plant on Mifflin Street, and on May 1 will move its New York office to 111 Broadway.

Newman-Crosby Steel Corp. has moved its sales office from 25 Church Street to the Woolworth Building, New York.

Morgan Engineering Co. has moved its New York offices to room 2482, 11 West 42nd Street. The office is in charge of E. J. Parker, Eastern sales manager.

Goddard & Goddard Co., Inc., manufacturer of milling cutters, Detroit, is now represented in New England by H. F. Miller, whose headquarters are at 394 Riverway Drive, Boston, and in Indiana south of South Bend by G. T. Osborne, whose headquarters are at 806 North Oakland Avenue, Indianapolis.

Manealoff & Co., Inc., importer of steel and non-ferrous metals, has moved its offices to 19 Rector Street, New York.

Hickman, Williams & Co., Inc., has removed its Pittsburgh offices from 1607 Oliver Building to 1910 Clark Building.

Shipments of mining and electrical locomotives in the first quarter of 1933 were valued at \$44,350 compared with \$217,543 in the corresponding quarter of last year, according to reports received by the Bureau of the Census from 10 manufacturers.

The production of babbit metal in March totaled 1,134,928 lb., against 1,177,917 lb. in February, according to reports received by the Bureau of the Census from 40 manufacturers.

Chicago Steel Output Now Averages 28 Per Cent

**Gain in Production Accompanies Rise in Demand—Pig Iron Buying
Gains—Scrap Prices Strong**

CHICAGO, May 2.—A blast furnace has been lighted at Gary, bringing the total number of steel works furnaces to seven out of 36 in the district. Some mills had accumulated sizable tonnages of pig iron, and liberal quantities of cold iron are now being used. Ingot output has gained several more points, the range now being from 27 to 28 per cent of capacity.

The automobile industry still furnishes the bulk of support to the market, but miscellaneous consumption is showing a satisfactory gain from week to week. Mill backlogs are light and consumer pressure for delivery is insistent. Of special interest is the fact that individual orders are growing in size, and though mills are scheduling more or less on a week-to-week basis, they find it much less difficult to arrange rollings than a month ago.

Prices are in the limelight. Quotations on sheets are being advanced and hot-rolled strip is being marked up \$2 a ton. Each sale of scrap brings a new top and the strength shown by pig iron foreshadows a probable advance. Higher prices for scrap are reflected in added firmness in all finished steel prices.

Farm implement manufacturers, though feeling more hopeful, are still relatively inactive, and the building industry and the railroads are for the most part out of the steel market.

Pig Iron

Prices have gained added strength and most foundrymen regard advances as a strong possibility. In fact, this belief accounts for much of the interest in new buying, which is still gaining in volume. Actual releases are larger, April having been the best month in almost a year and fully double March. Fresh inquiries are attractive, among them being 800 tons of low phosphorus for delivery east of Chicago. Several lots of 500 tons and larger are being sought by Indiana and Illinois melters.

Cast Iron Pipe

Outstanding in new business is 3800 tons awarded by St. Louis to three cast iron pipe producers. Other new orders are small, but include a little private tonnage. Progress is being made on the substructure for the Wilmette, Ill., pumping plant and the pipe needed may be purchased in the near future. The R.F.C. has recently made five releases that will aid the pipe market. One of these is at Michigan City, Ind., and another is in

Iowa. Some cities still have on hand unladen pipe carried over from last year.

Reinforcing Bars

State roadwork is again on the way, though the bulk of the Illinois program is still tied up while settlement is reached in the matter of cement prices. Bars are now moving to southern Illinois road projects, and the State has let general contracts calling for 300 tons. Indiana has placed tonnage with mills in that State. Fresh inquiries, though still very small in the aggregate, are more numerous. A small amount of private work is making its appearance. There is a delay of a week or two in taking prices on the 1000 tons for the Chicago Carton Co. Prices show a stronger tendency.

Warehouse Business

April shipments topped March by a satisfactory margin and the trend is still upward. Business improved steadily as April advanced, which is contrary to ordinary performance when the peak of the month usually comes during the second or third week. Prices are steady, especially on heavy lines.

Plates

Tentative inquiries are again coming from oil producers. The tonnages involved are said to be attractive, but they will not be brought into the market until oil producers are more definitely assured of a continued gain in business. Railroad shops continue to call men to work, but orders for repair steel remain very light. The Reconstruction Finance Corporation is releasing loans to municipalities, and additional water tank and steel pipe business should come out in the near future.

Rails and Track Supplies

The rail market remains very dull, even tentative inquiries being lacking. Both local mills are on light schedules, and will remain on them for a few weeks in the hope that new business will develop. The light rail market is making the best showing in over a year, but tonnages are light and scattered. Releases and new orders for track accessories are at the level of recent weeks, and while far from normal they are well ahead of current shipments of rails.

Hot-Rolled Strip

Prices are being advanced \$2 a ton to 1.65c. per lb., Chicago. Automobile manufacturers continue to take heav-

ier shipments and miscellaneous demand is also improved.

Sheets

Specifications remain steady and hot mill output holds at 50 per cent of capacity. Mill backlogs are extremely light, the bulk of orders being for very prompt shipment and rolling schedules being arranged on a week-to-week basis. Some producers are testing the market by advancing prices \$2 to \$3 a ton, hot-rolled products being marked up \$2 a ton and cold-rolled products \$3.

Wire Products

By the end of April output was at the rate of 40 per cent of capacity and the tendency is still upward. The farmer, encouraged by advances in prices for his products, is a heavier buyer and demand from all the manufacturing trades is moderately better. In addition some industries that long have been dormant have come to life, among these being toy manufacturers and makers of bolts, nuts and rivets and furniture. There has been some public utility buying of copper wire to the east of Chicago. Warehouse stocks are still sizeable.

Structural Steel

Demand is extremely light and early improvement depends on the launching of Government work. Shop output is as low as at any time in over a year. It is reported here that the R. F. C. has approved the loan for the San Francisco-Oakland bridge. The steel for the superstructure of this project, 120,000 tons has been awarded to the Columbia Steel Co.

Bars

Miscellaneous demand has made further gains and it is noticeable that individual orders are growing in size. Farm implement manufacturers remain quiet, though occasionally one of them will take a small quantity of steel. Road machinery builders are cautious pending a crystallization of the attitude of various States toward highway construction programs. Some bar mills continue to produce at close to 40 per cent of capacity.

Scrap

About 10,000 tons of heavy melting steel has been taken by a steel mill at \$7.75 a gross ton, delivered, and the price is unusually strong, especially following reports of new high prices paid to the east of Chicago. A number of railroads are offering large lists and they are selling at present levels. Two cargoes of scrap are leaving Chicago for Lake Erie and there remains about 10,000 tons for water shipment. Over 20,000 tons has been sold at Duluth for boat shipment. Recent sales of various grades all have brought out higher prices.

National Metal Trade Association, 1021 Peoples Gas Building, Chicago, will hold its thirty-fifth annual convention, June 8, 1933, at the Congress Hotel, Chicago.

Demand Gathers Momentum in Eastern Pennsylvania

**Steel Buying Broadly Diversified—Scrap Continues to Advance—
Steel Operations Gain**

PHILADELPHIA, May 2.—Iron and steel business in this district continues to swing upward. It is gathering substantial momentum and, barring unforeseen forces, gives promise of developing to a basis where the long period of losses will give way to profits. Buying covers a broad diversification of lines and is most marked in sheets, merchant bars and structural material. The increased prices in sheets and strip steel have stimulated specifications considerably and brought about new orders to a lesser degree. Uniformly mills report a gain in orders, some booking larger tonnages than at any time since the stock market crash in the fall of 1929.

The scrap market has proved unusually sensitive to rising operations and has reflected further sharp increases in prices. The greatest increase has been in No. 1 railroad wrought which has shot up \$3 per ton to \$11. Other grades have moved up from 50c. to \$1.50.

Steel works operations have risen two points to 15 per cent of capacity. Finishing operations show a greater increase.

Pig Iron

The market shows a stronger tone and if the improvement continues another rise of \$1 in price for eastern Pennsylvania appears probable. Southern iron has been increased \$2 per ton to \$12, base, Birmingham, or \$17 to \$17.25, Philadelphia. Inquiry for foundry grades has increased somewhat, though the melt has grown but little. One consumer is inquiring for 300 tons of foundry iron for fourth quarter delivery. Blast furnace operators generally are not quoting beyond the third quarter but some are reported to be accepting orders for the last quarter at \$1 over current levels. Imports of Indian iron received at Philadelphia so far this year total 10,169 tons. The \$7 rise in ferromanganese to \$68, seaboard, for delivery up to July 1 is attributed to the general improvement in the market, together with the rise in foreign exchange and the Treasury notice of suspected dumping of German ferromanganese.

Plates, Shapes and Bars

Mills report a fair increase in bookings of shapes and merchant steel bars, and a slight bulge in orders for plates. Prices remain unchanged but reflect a better tone. Specifications are coming from miscellaneous consumers, though purchases by railroads are small. The Philadelphia Gas Co.

has taken bids for a gas holder and the enlargement of another at Point Breeze, Philadelphia, requiring about 2500 tons of plates and 1000 tons of shapes.

Sheets

Eastern makers have followed producers in others districts in advancing prices of sheets and strip steel. The increases range from \$2 to \$3 and are to apply to shipments over the remainder of the current quarter. Philadelphia delivered prices are: Hot-rolled sheets, No. 10, 1.81c.; hot-rolled sheets, No. 24, 2.41c., increases of \$2; cold-rolled sheets, No. 10, 2.36c. and cold-rolled sheets, No. 20, 2.61c., advances of \$3. Specifications are coming to mills more freely and operations have been stepped up as a result. One mill making commercial grades is now operating at 60 per cent of capacity and another rolling full-finished lines is producing at a rate of between 35 and 40 per cent of capacity. The Republic Steel Co. was low bidder at 2.80c., Raleigh, for 140 tons of sheets for automobile license tags for North Carolina. Releases by automobile body builders have increased, and this class of consumers along with others are pressing mills for early deliveries.

Warehouse

Jobbers report that buying has shown no marked improvement. Some warehouses showed a decline in April business under that of March. Galvanized sheets, No. 24, have been advanced \$2 to 3.60c. for 50 bundles or over, while hot-rolled annealed sheets, No. 10, have been reduced \$4 to 2.50c., with deductions for orders of 4000 lb. or more.

Imports

The following iron and steel imports were received here last week: 2154 tons of pig iron from British India, and 800 tons of the same product together with 5 tons of galvanized steel strips from England; 55 tons of structural shapes, 45 tons of steel bars, 30 tons of steel bands, 28 tons of diamond plates and 10 tons of steel hoops from Belgium; 10 tons of sponge iron from Sweden; 6 tons of hollow drill steel from Norway; and 5 tons of manganese ore from Germany.

Scrap

The market has developed further sharp rises, the most notable being an increase of \$3 in No. 1 railroad wrought, which has been sold at \$11. Other grades have advanced from 50c. to \$1.50 per ton based on sales or mill offers. The rapid upward turn

has made trading rather difficult, with some dealers holding off for further gains. Mills also are showing some concern and are waiting for the market to become more settled. No. 1 heavy melting steel remains unchanged at \$8 to \$8.50.

Cincinnati Pig Iron Buying Has Increased

CINCINNATI, May 2.—Improved market sentiment during April was reflected in a fair increase in pig iron bookings. Adherence to announced price schedules by both Northern and Southern furnaces is compelling buyers to contract for small tonnages in anticipation of improved business, lest further advances in iron prices be made. An Indiana melter who had bought 100 tons of Northern iron a fortnight ago bought 150 tons the past week without inquiry, and a south central Ohio consumer added 100 tons to an order previously placed. Marked quietness has developed in Southern iron since the announcement of price increases; orders the past week were for small lots and insufficient to test quotations.

Steel

Further expansion of demand from stove, refrigerator and automobile manufacturers brought sheet bookings to about the 50 per cent capacity output level. Buyers generally are trying to cover following further price advances on strip and hot-rolled sheets.

Scrap

A fairly general increase in dealers' bids the past week failed to attract an adequate supply of material into the market, making dealers more interested in buying than selling. One mill in this district purchased 9000 tons of rails on a special list of the Louisville & Nashville Railroad at a price reported to reflect a decided advance over the recent market.

Detroit Scrap Prices Rise 50c. to \$1.50 a Ton

DETROIT, May 2.—The rapid increase in steel production, an impending shortage of scrap, and speculation stimulated by the threat of inflation have contributed to marked advances in the scrap market the past week. Dealers have bid up steel grades 75c. to \$1.50 a ton, with heavy melting steel bringing as high as \$8. Cast iron grades have lagged behind other items, although automotive cash registered a gain of 50c. a ton. Dealers are reluctant to let go of their holdings at present prices, preferring to wait for what they believe is a further inevitable rise in quotations in the immediate future.

Steel Business Broadens in Cleveland Territory

Demand from Automobile Industry Maintained While Orders from Miscellaneous Sources Expand—Steel Output Off

CLEVELAND, May 2.—Orders for finished steel made further gains the past week. Demand from the automotive industry is holding to recent volume and business from miscellaneous sources has broadened. Bookings by some of the steel companies in April were the best in many months.

The Corrigan McKinney Steel Co. has put on two additional open-hearth furnaces, now operating eight out of 14, the increase being due largely to heavier demand for semi-finished steel for conversion into sheets for the automotive industry. Ingot output in Cleveland, after temporarily reaching 41 per cent of capacity, is at 38 per cent this week, the American Steel & Wire Co. having shut down its local plant in which three furnaces were operating, as steel for its local finishing mills hereafter is to be supplied from the Lorain works of the National Tube Co. This company also shut down the one blast furnace it has been operating in Cleveland and its local coke works.

Orders for steel from the automotive industry, while not for large individual lots, are fairly numerous for early requirements. The present automotive demand is expected to be maintained through May. Miscellaneous buyers are ordering in somewhat larger lots than recently because of increased plant operations and to partially build up badly depleted stocks.

Producers have shown no hesitation in falling in line with price advances of \$2 a ton on hot-rolled sheets, \$3 a ton on cold-rolled sheets and \$2 on hot-rolled strip for the remainder of the quarter, and buyers not under cover have placed orders at the advance without waiting for a test of the new prices. There is talk of further advances for the third quarter. Cold-rolled strip, while not advanced, is firmer, with some producers holding to a minimum of 1.90c. Pig iron is firmer but no higher. Scrap prices continue their upward climb, with local advances of from \$1 to \$1.50 per ton.

Pig Iron

Activity increased moderately during the week. While some buying is of a speculative character the actual demand has increased. Foundries making automobile castings are busier than last month and have increased specifications, and those making malleable automobile castings, largely for the Ford Motor Co., are operating at a good rate. Demand from manufac-

turers of radiators and heating furnaces has improved. A leading producer shipped more iron in April than during any previous month since last May. The market is very firm at \$14.50, Lake furnace, for foundry and malleable grades. The Cleveland price is unchanged at \$15. Makers of Jackson County silvery iron have advanced their asking price \$1 a ton to \$19 for 8 per cent, but inquiries are to be submitted for quotations.

Iron Ore

Water shipments of Lake ore started last week with a movement of several cargoes from Superior, Wis. April shipments amounted to 83,210 tons as compared with 44,073 tons during April last year. The Steel Corporation is starting several boats for cargoes this week.

Bars, Plates and Shapes

Orders for steel bars show a further gain both from automotive and other sources. While considerable tonnage is going to Michigan automotive plants, the demand in this territory is largely from miscellaneous consumers. Local forge shops are not getting much automotive work. Recent improved activity in plates is being maintained. Structural material is quiet, there being no revival of activity in the building field. The upward price tendency on other steel products has not affected bars, plates and shapes. Merchant bars are firm at 1.65c., Cleveland.

Bolts and Nuts

Orders from the automotive industry show a gain. Shipments during April were better than in March and a further increase is expected this month. Prices are firm.

Strip Steel

The expected \$2 a ton advance on hot-rolled strip to 1.55c., Pittsburgh, has been announced by leading producers. The automotive industry is well covered for the quarter at the old price. Specifications from this industry continue fairly heavy. Miscellaneous orders show a gain. Cooperage hoop has also been advanced \$2 a ton to 1.65c., Pittsburgh. Cold-rolled strip is unchanged at 1.80c. to 2c., Cleveland.

Sheets

Price advances of \$2 a ton on hot-rolled and \$3 a ton on cold-rolled sheets have been announced by leading manufacturers. While considerable business had been placed at the old prices largely by the automotive

industry, consumers generally were not given an advance notice of the change or an opportunity for last minute coverage at the old prices. Some business has been placed at new prices. Miscellaneous demand has broadened. Specifications from the electric refrigerator industry are holding up well and steel barrel makers are doing slightly better. Vitreous enameling sheets are unchanged. New prices are: No. 10 hot-rolled, 1.50c.; hot-rolled annealed, 1.65c.; No. 24 hot-rolled annealed, 2.10c.; heavy cold-rolled, 2.05c. and light cold-rolled, 2.45c.

Scrap

Prices continue to move upward, most grades having advanced \$1 to \$1.50 a ton during the week. While there have been no sales to local consumers at the higher price, Valley district mills made small purchases last week and dealers are paying \$11 and \$10.50 for No. 1 and No. 2 heavy melting steel respectively to fill these orders. For shipment to a Cleveland consumer dealers are now paying \$9.50 for No. 1 and \$9 for No. 2. The amount of scrap that is coming out has not been noticeably increased by the higher prices.

Buffalo Pig Iron Sales Gain; Steel Output Up

BUFFALO, May 2.—Buffalo pig iron furnaces are declining to quote for later delivery than Oct. 1, although several inquiries have been received for the last quarter. Several good sized lots have been placed, some running as high as 1000 tons. A 900-ton inquiry from New York state is current. It is probable that 10,000 tons or more was sold during the past week by local furnaces.

Steel

The Bethlehem Steel Corp. stepped up operations at its Lackawanna plant the fore part of last week to six units and later in the week increased to seven. There is a possibility that eight open-hearths will be active some time this week. The Republic Steel Corp. now has four open-hearths in service, while the Wickwire Spencer plant continues with one. The Seneca plant division of Bethlehem is operating at about 30 per cent. A recreation building for the University of Buffalo, on which bids went in on Monday, will require from 200 to 300 tons of structural steel.

Scrap

An outstanding scrap sale was 1000 tons of cupola cast scrap. The price paid is said to have been \$8.50 or \$9. Low phosphorous billet crops have been sold at higher prices than were quoted last week. The market is very firm.

The Bureau of Customs, Washington, has made a finding that cast iron pipe from France is not being dumped into the United States.

Steel Demand Shows Sharp Gain in New York Area

Steel Bookings for Some Companies Are Largest in a Year—Pig Iron Demand Also in Good Volume

NEW YORK, May 2.—Rising prices, increasing specifications and heavier forward contracting have given the local steel market a buoyancy that it has lacked for many months. Advances of \$2 to \$3 on sheets and \$2 on hot-rolled strip drove in considerable second quarter contract business at previously prevailing quotations. Demand for tin plate continues active and wire specifications have improved. One mill selling a wide range of products has had the best week in bookings in a year. Another leading producer booked 70 per cent more tonnage in this district in April than during the same month of 1932. The gain over March, which was adversely affected by the bank holiday, was very large, while the increase over February was nearly one-third. Forward contracting for steel has been limited mainly to the present quarter, since mills are reluctant to give longer protections in view of the uncertainty of costs.

Demand for heavier rolled products has not risen materially, although in some cases customers have expanded their specifications moderately. Price advances on bars and shapes are not regarded as imminent, but a strengthening of plate quotations would be a natural development if the general business situation should continue to improve. Railroads have released delayed specifications on track accessories, but otherwise give no indications of taking more steel. Demand from the brewing industry has thus far been limited to the purchase of a few steel aging tanks.

There is a slight pick-up in small orders for reinforcing bars, but no large projects are in the market or in sight. The foreign exchange situation has shut out negotiations for foreign bars, and no imports are expected in the near future.

Pig Iron

Sales, at 5000 tons, compared with 4000 tons last week and 2500 tons two weeks ago. Inquiries are declining in number but melters are still in a mood to cover their future requirements, in some cases asking for prices on fourth quarter deliveries. The gain in demand in this territory has been due almost entirely to a desire for protection against possible price advances. Foundry melt has not increased and apparently castings orders have not yet shown material improvement. The inclination of melters to contract ahead is matched by a reluctance of domestic furnaces to commit themselves beyond the third quarter. Scrap prices have already

risen materially and it is feared that advances in other raw materials may lift production costs appreciably. Another consideration with pig iron makers is that present prices are unprofitable. A New Jersey melter has closed for 500 tons. The A. P. Smith Mfg. Co., East Orange, N. J., which recently bought 400 tons, is now in the market for 150 tons each of No. 2 plain and No. 2X for fourth quarter shipment. The General Electric Co. has taken prices on 800 tons of various grades for third quarter delivery at Elmira, N. Y., and the Whitin Machine Works, Whitinsville, Mass., is in the market for 1000 tons. Owing to exchange fluctuations, foreign producers are requiring that quotations on current inquiries be submitted to them for confirmation or rejection.

Scrap

The New York scrap trade is more active than it has been at any time in more than a year. Prices have advanced on steel-making and blast furnace grades, which are most in demand. Dealers are now offering \$5 to \$5.50 for No. 1 heavy melting steel, the higher price being paid for export shipments. If there is further strength at Pittsburgh and in the Valleys, exporters will not be able to procure supplies along the Atlantic seaboard at present offering prices.

Birmingham Pig Iron Output Is Increased

BIRMINGHAM, May 2.—The Republic Steel Corp. resumed the making of pig iron on Monday, blowing in its No. 2 furnace, which had been banked since Dec. 31. Three furnaces are now in blast in the district. Two are making foundry iron and the other basic. The Sloss-Sheffield Steel & Iron Co. may resume pig iron production about June 1. Current sales are small on account of the bookings made before the price advance of three weeks ago. Total shipments of pig iron by the three merchant producers during April were only slightly ahead of the March tonnage. One company did not ship as much, another was barely ahead of March, while the third had a moderate increase. The new base price of \$12 is firm. The pressure pipe situation is still sluggish, and the course of the market during the next few months will be shaped almost entirely by the availability of Federal financing. April sales and April shipments were not much better than those of

March. The base price of \$32 to \$33 is being maintained. New tonnage of last week was in small lots.

Steel

For one producer, April was the best month of the year and one of the best in the past 16 months. This applied not only to new bookings, but also to specifications, shipments and inquiries. The April business of another producer varied little from week to week and ran about the same as in March. The high levels of the month for new tonnage seem to be holding fairly well. Some light products are beginning to lag, after a period of activity, as a result of seasonal change. Plate inquiries have begun to appear again to a limited extent, noticeably for barge and oil tank work. Following the advance of \$2 a ton in galvanized sheets, similar advances of \$2 have been made in No. 10 hot-rolled and No. 24 hot-rolled annealed, effective immediately. Since the first week in April seven open-hearths have been active. No change was made last week and none is expected this week. The Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. operated four days last week.

St. Louis Buying of Steel and Pig Iron Increasing

ST. LOUIS, May 2.—The St. Louis Gas & Coke Co. last week sold several thousand tons of pig iron in lots of from 100 to 200 tons. Larger inquiries are still pending, but it is expected that most of these will be closed shortly. Specifications against contracts are very good. Additional sales of Southern iron at the higher price, to which it is reported there has been no resistance, were made during the week. Generally, there is decidedly a better feeling in the trade.

Steel

With jobbers buying to round out their stocks and fabricators covering their requirements, mills report there has been an increase in purchasing of plates, shapes and bars during the last week. Also there has been a slight pick-up in buying of wire products for agricultural uses. Because of the possibility of higher prices, as the result of the enactment of inflationary measures, mills are declining to give protection on quotations exceeding normal requirements, and, in any event, not beyond the present quarter.

The State of Missouri will open bids May 5 on highway projects requiring approximately 1500 tons of structural steel, 500 tons of reinforcing bars and 800 tons of mesh wire for pavements.

Steel interests are undecided as to the ultimate effect of the drop in the price of crude oil in the Texas fields to 10c. a bbl. While it probably will stop drilling operations, it might, on the other hand, cause a rush for storage

tanks that would stimulate the buying of plates.

Scrap

Dealers have increased their buying prices of scrap from 50c. to \$1 a ton on a number of items, the strength of the market being based on expected buying by mills in the district and higher prices and greater activity in the Chicago and Valley districts. If there is any marked pick-up in business, dealers believe that present stocks of mills should not last longer than 30 to 40 days. Railroad lists: Missouri Pacific, 30 carloads; Missouri-Kansas-Texas, 2000 tons.

Steel Contracts Awarded For San Francisco Bridge

SAN FRANCISCO, May 1.—Official award of contracts has just been made for the construction of the San Francisco-Oakland bridge. The Columbia Steel Co., subsidiary of the United States Steel Corp., with a combined bid of \$22,530,567, took contracts Nos. 6, 6A and 7. The West Bay super-structure will require 62,305 tons of structural steel, 1100 tons of reinforcing bars, 900 tons of cast steel, 18,700 tons of cable wire and 830 tons of cable castings. The East Bay super-structure will require 50,675 tons of structural steel, 1058 tons of reinforcing bars, 4250 tons of heat-treated eyebars and 3400 tons of nickel steel.

Other contracts were awarded as follows: The Transbay Construction Co. will build the West Bay sub-structure, which will require 1900 tons of reinforcing bars, 150 tons of shapes and 225 tons of timber fastenings. The contract for the East Bay sub-structure, using 1140 tons of bars and 165 tons of shapes, was awarded to Bridge Builders, Inc. The San Francisco anchorage and structure to Rincon Hill, requiring 1280 tons of structural steel and 1840 tons of reinforcing bars, went to the Healy-Tibbitts Construction Co. The Clinton Construction Co. was awarded the contract for the Yerba Buena Island crossing and tunnel, which will need 2200 tons of bars, 1500 tons of shapes and 1500 tons of plates. With the general contracts awarded, a number of sub-contracts for steel will undoubtedly be placed in the next few weeks.

Proposals are being considered at Pittsburg, Calif., for the formation of a water district. The construction work would require 972 tons of cast iron pipe, 240 tons of plates and from 1500 to 3424 tons of steel pipe. At San Francisco all bids on the county jail have been rejected and new bids will be taken May 5. Bids are being taken for a torpedo storage building at Pearl Harbor, Hawaii, which will use 250 tons of reinforcing bars. Bids are also being taken at the same place for piers and quay walls, which will require 2000 to 3000 tons of bars.

Fabricated Structural Steel

Awards Large—New Projects in Good Volume

LETTINGS of 126,135 tons are the heaviest since the last week in October, 1931, and are swelled by a single award of 120,000 tons for super-structures for the San Francisco-Oakland bridge. New projects call for 24,100 tons, 22,000 tons of which will be required for sub-structures and anchorages for the San Francisco-Oakland bridge. Fabricating contracts in April totaled 43,850 tons, compared with 50,300 tons in March and 47,000 tons in February. Awards for the week follow:

NORTH ATLANTIC STATES

Newton, Mass., 100 tons, bridge, to Lackawanna Steel Construction Corp.

Stapleton, S. I., 1800 tons, United States Marine Hospital, to Bethlehem Fabricators, Inc.

Brooklyn, 330 tons, theater at Brighton Beach Avenue and Hoff Street, to National Bridge Works.

Maplewood, N. J., 270 tons, H. L. Ward home, to Belmont Iron Works.

Dannemora, N. Y., 900 tons, New York State prison buildings, to Lackawanna Steel Construction Corp.

New York, 360 tons, column guards, etc., for New York Central Railroad, to Sexauer & Lemke, Long Island City.

SOUTH AND SOUTHWEST

Fort Worth, Tex., 800 tons, refinery for Marathon Oil Co., to N. W. Kellogg Co., New York.

Fort Worth, Tex., 230 tons, airplane hangar, to Fort Worth Structural Steel Co. and North Texas Iron & Steel Co.

Hattiesburg, Miss., 150 tons, post office, to Bristol Iron & Steel Co.

CENTRAL STATES

Champaign City, Ill., 130 tons, truss span, to Duffin Iron Co.

Randolph City, Ill., 240 tons, bridge spans, to Vincennes Bridge Co.

Chicago, 125 tons, battle of Gettysburg building for World's Fair, to an unnamed bidder.

Chicago, 150 tons, auditorium for World's Fair, to Duffin Iron Co.

WESTERN STATES

San Francisco, 120,000 tons, super-structures for San Francisco-Oakland bridge, to Columbia Steel Co.

Los Angeles, 154 tons, Sunset Boulevard bridge, to Consolidated Steel Corp.

Los Angeles, 271 tons, Temple Street bridge, to Consolidated Steel Corp.

Pend Oreille County, Wash., 123 tons, bridge over Slate Creek, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

New York, 250 tons, garage.

Yonkers, N. Y., 500 tons, St. Joseph's Hospital.

Buffalo, 250 tons, Norton Hall for University of Buffalo; bids this week.

Pittsburgh, 350 tons, market building and garage for Kaufmann Department Stores, Inc.

Villanova, Pa., 450 tons, monastery for Villanova College; H. E. Baton, Philadelphia, general contractor.

Philadelphia, 900 tons, American Philosophical Society building; bids rejected owing to litigation over site for building.

CENTRAL STATES

Muskegon, Mich., 225 tons, dock and market.

Sheboygan, Wis., 125 tons, court house; Joseph A. Halpuch Co., 4010 West Madison Street, Chicago, low bidder on general contract at \$500,000.

Chicago, 100 tons, Twelfth Street bridge to World's Fair.

WESTERN STATES

Billings, Mont., 225 tons, building for Great Western Sugar Co.

San Francisco, 22,200 tons, sub-structures and anchorages for San Francisco-Oakland bridge; 14,000 tons, for sub-structure for West Bay crossing, 3000 tons for sub-structure for East Bay crossing, 4000 tons for Goat Island tunnel and anchorage, and 1200 tons for San Francisco anchorage.

San Francisco, 800 tons, County jail; all bids rejected, new bids to be taken May 5.

FABRICATED PLATE

AWARDS

New York, 255 tons, tanks for Molasses Products Co., to Maxwell Corp.

Brooklyn, 300 tons, aging tanks for Piel Brothers, brewers, to Dover Boiler Works, New York.

Chicago, 135 tons, 27 tanks for Best Malt Products Co., to Graver Tank & Mfg. Corp.

Chicago, 220 tons, tanks for Pure Oil Co., to Chicago Bridge & Iron Works.

Atlantic Gulf & Pacific Co., 450 tons, pontoon and land pipe, to Lancaster Iron Works.

NEW PROJECTS

Chelsea, Mass., 200 tons, oil tanks.

Philadelphia, 2500 tons, new gas holder and enlargement of another for Philadelphia Gas Co.; bids in.

Torrance, Cal., 200 tons, elevated tank; bids soon.

Pittsburg, Cal., 240 tons of 32-in. welded pipe.

Reinforcing Steel

Awards 1200 Tons—New Projects, 750 Tons

El Reno, Okla., 200 tons, Federal prison buildings, to Capital Iron & Steel Co., Oklahoma City.

Denver, 200 tons, for Boulder Dam, Specification No. A3187, to Pacific Coast Steel Corp.

San Jose, Cal., 100 tons, Julian Street bridge, to Soule Steel Co.

San Jose, 100 tons, State armory, to Pacific Coast Steel Corp.

Pasadena, Cal., 500 tons, Pine Canyon dam, to Blue Diamond Corp.

Los Angeles, 100 tons, supplies for harbor commission, to McClintic-Marshall Corp., Consolidated Steel Corp. and Vernon Tool Co.

NEW REINFORCING BAR PROJECTS

Sheboygan, Wis., 500 tons, court house; Joseph A. Halpuch Co., 4010 West Madison Street, Chicago, low bidder on general contract at \$500,000.

State of Missouri, 500 tons, highway projects; bids May 4.

San Francisco, 730 tons, County jail; all bids rejected, new bids to be taken May 5.

Pearl Harbor, T. H., 250 tons, torpedo storage building, bids under advisement.

Non-Ferrous Metals Again Active and Strong

Copper Sold at 6.75c.—Tin Highest in Three Years—
Zinc Advances—Lead Sales Large

NEW YORK, May 2.—Two developments during the week have strengthened the copper market—passage of the inflation legislation by the Senate on Friday and more definite indications of further curtailment in copper production. Announcement by the Phelps Dodge Corp. of a 50 per cent reduction in output, or from 20 per cent to 10 per cent of capacity, buoyed the hopes of those working for a complete shut-down.

Domestic buying of electrolytic copper for delivery through June has continued in satisfactory, though not heavy, volume. Prices have advanced moderately. Yesterday a majority of sellers were quoting 6.75c. a lb., delivered Connecticut, with sales made at this level. At least one source was offering at 6.50c., but the quantity available was reported as not large. Today the same situation prevails, with the range still at 6.50 to 6.75c. a lb. This is the highest level since Feb.

9, 1932. According to one estimate, sales of copper for the week ended April 26 were about 6000 tons, and it is estimated that this week's total will be about the same. Lake copper is moderately active and firm at 6.50c., delivered New York. M. Pisart of the Katanga company is to arrive in New York today for conferences.

Tin

Insistent buying again this week has elevated prices for spot Straits tin to the highest levels in three years. With sales of about 1000 tons for the week ended today, spot Straits tin changed hands today at 32.50c. a lb., New York, which, with the exception of 32.62½c. yesterday, is the highest price since May 14, 1930, when the quotation was 33.12½c. Demand today is a little less intense. The buying has been largely for May and June. Purchases of future metal are scarce due to the premium for sterling exchange. Purchases by consumers

are more than for normal requirements, indicating accumulations of some stocks. The London market is also active with quotations considerably higher than last week. Spot standard today is £173 7s. 6d. a ton, future standard £174 and spot Straits £187 7s. 6d. which is £16 a ton higher than last week, due to a scarcity in that market. The Singapore price today is £184 5s. which is up about £13 for the week. Deliveries into American consumption for April were 4553 tons. The decrease in the visible supply last month was 987 tons which, with a carry-over at the Straits of about 800 tons, makes the total decrease about 1800 tons.

Lead

Buying has continued in heavy volume throughout the week, but prices continue unchanged and firm at 3.37½c. a lb., St. Louis, or 3.59c., New York. Bookings for June have been large and there have also been purchases for May and some for spot delivery, indicating, it is believed, that much of this metal is going directly into consumption. Nearly all major consuming lines, particularly the munitions makers, are participating in the buying.

Zinc

After slipping slightly during the week, prime Western zinc firmed up on April 29 on heavy buying, with the closing quotation at 3.75c. a lb., East St. Louis, or 4.12c., New York. Buying was done from 3.65c. to 3.75c. Since then the market has been quieter, with the price firm at 3.75c. This is the highest quotation since Sept. 12, 1931. Galvanizers are reported by one seller as large buyers.

Ore prices at Joplin were unchanged on April 29 at \$24 a ton. Purchases were 2800 tons against 5500 tons for the preceding week. Output is placed at about 4100 tons for the week, with stocks estimated at about 17,300 tons.

Copper Averages

The average price of Lake copper for April, based on daily quotations in THE IRON AGE, was 5.64c. a lb. delivered New York. The average price of electrolytic copper for that month was 5.38½c., refinery, or 5.63½c., delivered Connecticut.

The Jones & Laughlin Steel Corp. is blowing in a blast furnace at Aliquippa, Pa., this week. The Tonawanda Iron Corp., North Tonawanda, N. Y., expects to light its furnace in the near future.

Marked improvement in export sales is reported by the Packard Motor Car Co. In the first quarter of 1933, according to the company, sales exceeded those of the first quarter of 1932 by more than 26 per cent.

The Week's Prices. Cents Per Pound for Early Delivery

	April 26	April 27	April 28	April 29	May 1	May 2
Electrolytic copper, N. Y.*	6.25	6.25	6.25	6.25	6.25	6.25
Lake copper, New York	6.50	6.50	6.50	6.50	6.50	6.50
Straits tin, Spot, N. Y.	29.95	29.60	30.25	...	32.62½	32.50
Zinc, East St. Louis	3.70	3.65	3.65	3.70	3.75	3.75
Zinc, New York	4.07	4.02	4.02	4.07	4.12	4.12
Lead, St. Louis	3.37½	3.37½	3.37½	3.37½	3.37½	3.37½
Lead, New York	3.50	3.50	3.50	3.50	3.50	3.50

*Refinery quotations price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.25c. a lb., New York.
Brass ingots, 85-5-5-5, 6.50c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.	34.00c. to 35.00c.
Tin, bar.	36.00c. to 37.00c.
Copper, Lake.	7.75c. to 8.50c.
Copper, electrolytic.	7.50c. to 8.00c.
Copper, castings.	7.25c. to 8.25c.
*Copper sheets, hot-rolled	13.97½c.
*High brass sheets.	11.75c.
*Seamless brass tubes	13.50c.
*Seamless copper tubes	12.62½c.
*Brass rods.	9.25c.
Zinc, slabs.	5.00c. to 5.50c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig.	4.50c. to 5.50c.
Lead, bar.	6.00c. to 7.00c.
Lead, sheets.	7.25c.
Antimony, Asiatic.	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus.	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, ½ and ⅔.	21.00c. to 22.00c.
Babbitt metal commercial grade.	21.00c. to 32.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.	36.62½c.
Tin, bar.	38.62½c.

Copper, Lake.	7.87½c.
Copper, electrolytic.	7.87½c.
Copper, casting.	7.62½c.
Zinc, slab.	4.50c. to 5.00c.
Lead, American pig.	4.25c. to 4.75c.
Lead, bar.	7.75c.
Antimony, Asiatic.	8.50c.
Babbitt metal, medium grade.	17.75c.
Babbitt metal, high grade.	40.62½c.
Solder, ½ and ⅔.	22.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.	4.875c.	5.625c.
Copper, hvy. and wire	4.75c.	5.50c.
Copper, light and bottoms	4.00c.	4.50c.
Brass, heavy	2.75c.	3.00c.
Brass, light.	2.00c.	2.37½c.
Hvy. machine composition	3.50c.	4.125c.
No. 1 yel. brass turnings	3.00c.	3.50c.
No. 1 red brass or compos. turnings	3.25c.	3.75c.
Lead, heavy.	2.50c.	3.00c.
Zinc	1.625c.	2.125c.
Cast aluminum.	4.25c.	5.50c.
Sheet aluminum.	9.00c.	10.75c.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.I.F. Pacific ports	2.10c.

Billet Steel Reinforcing

(Cut lengths as quoted by distributors)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.55c.
F.o.b. Birmingham, mill lengths	1.55c.
F.o.b. Cleveland	1.55c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.86c.
Common iron, del'd New York	1.90c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.50c. to 1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.705c. to 1.8035c.
Del'd Philadelphia	1.4935c. to 1.5935c.
F.o.b. Coatesville	1.40c. to 1.50c.
F.o.b. Sparrows Point	1.40c. to 1.50c.
Del'd New York	1.598c. to 1.698c.
C.I.F. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.7035c. to 1.8035c.
Del'd Philadelphia	1.4935c. to 1.5935c.
Del'd New York	1.59875c. to 1.69875c.
C.I.F. Pacific ports (standard)	2.10c.
C.I.F. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series	Alloy	Differential
2000 (1% Nickel)	Nickel	per 100 Lb. \$0.25
2100 (1 1/2% Nickel)	Nickel	0.55
2300 (3% Nickel)	Nickel	1.50
2500 (5% Nickel)	Nickel	2.25
3100 Nickel Chromium	Nickel Chromium	0.55
3200 Nickel Chromium	Nickel Chromium	0.80
3300 Nickel Chromium	Nickel Chromium	2.80
3400 Nickel Chromium	Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flat)	Silicon Manganese Spring Steel (flat)	0.25
Round and Square	Round and Square	0.50
Chromium Nickel Vanadium	Chromium Nickel Vanadium	1.50
Carbon Vanadium	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is 5c. a lb. higher, with standard classification for cold-finish alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

Bars, f.o.b. Pittsburgh Mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars, eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill	1 1/2 in. 3.00c.
	1-3/16 to 1 1/4 in. 2.50c.
	1-9/16 to 1 1/2 in. 2.35c.
	1-15/16 to 2 1/2 in. 2.20c.
	2-15/16 to 3 in. 2.05c.

* In quantities of 10,000 to 19,999 lb.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot-Rolled

No. 10, f.o.b. Pittsburgh	1.40c. to 1.50c.
No. 10, f.o.b. Chi'o mill	1.50c. to 1.60c.
No. 10, del'd Philadelphia	1.71c. to 1.81c.
No. 10, f.o.b. Birmingham	1.55c. to 1.65c.
No. 10, c.I.F. Pacific Coast ports	2.02 1/2c.

Hot-Rolled Annealed

No. 10, Pittsburgh	1.55c. to 1.65c.
No. 10, Chicago mills	1.65c. to 1.75c.
No. 10, Birmingham	1.70c. to 1.80c.
No. 10, Pacific Coast ports	2.17 1/2c.
No. 10, wrought iron, Pittsburgh	3.60c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.00c. to 2.10c.
No. 24, f.o.b. Chi'o mills	2.10c. to 2.20c.
No. 24, del'd Philadelphia	2.31c. to 2.41c.
No. 24, f.o.b. Birmingham	2.15c. to 2.25c.
No. 24, c.I.F. Pacific Coast ports	2.65c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pitts'h	1.90c. to 2.05c.
No. 10 gage, f.o.b. Chicago mills	2.00c. to 2.15c.
No. 10 gage, del'd Phila.	2.21c. to 2.36c.
No. 10 gage, del'd Pacific Coast ports	2.52 1/2c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pitts'h	2.30c. to 2.45c.
No. 20 gage, f.o.b. Chicago mills	2.40c. to 2.55c.
No. 20 gage, del'd Phila.	2.61c. to 2.76c.
No. 20 gage, del'd Pacific Coast ports	2.96c.

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.70c.
No. 24, f.o.b. Chicago mills	2.80c.
No. 24, del'd Philadelphia	3.01c.
No. 24, f.o.b. Birmingham	2.85c.
No. 24, c.I.F. Pacific Coast ports	3.25c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terns

No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.75c.
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Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.90c.
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Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.30c.
No. 28, Chicago mill	2.40c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	\$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate

(F.o.b. Morganston or Pittsburgh) (Per Package, 20 x 28 in.)

8-lb. coating I.C.	\$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.90
25-lb. coating I.C.	13.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

	Base per Lb.
All widths up to 24 in., Pittsburgh	1.45c. to 1.55c.
All widths up to 24 in., Chicago	1.55c. to 1.65c.
Cooperage stock, P'gh.	1.30c. to 1.65c.
Cooperage stock, Chicago	1.60c. to 1.95c.

Cold-Rolled Strips

F.o.b. Pittsburgh	1.80c. to 2.00c.
F.o.b. Cleveland	1.80c. to 2.00c.
Del'd Chicago	2.20c. to 2.30c.
F.o.b. Worcester	2.00c. to 2.10c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	2.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)
Extras of 10c. a 100 lb. on mixed and joint carloads, 20c. on pool carloads and 30c. on less than carloads are applied on all merchant wire products. In carloads and mixed carloads a discount of 10 per cent on extras is allowed.

To Manufacturing Trade

Bright wire	2.10c.
Spring wire	3.10c.

To Jobbing Trade

	Base per Keg
Standard wire nails	\$1.85
Smooth coated nails	1.85
Galvanized nails	3.35
	Base per 100 Lb.
Smooth annealed wire	\$2.25
Smooth galvanized wire	2.60
Polished staples	2.85
Galvanized staples	2.80
Barbed wire, galvanized	2.35

Woven wire fence No. 9 gage, base column, per net ton \$50.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills

Butt Weld

Steel		Wrought Iron	
Inches	Black Galv.	Inches	Black Galv.
1/2	55 33	1/2	+ 9 1/2 + 13 1/2
3/4	60 1/2 42	3/4	+ 1 1/2 + 21 1/2
1	65 1/2 54	1	31 1/2 15
1 1/4	69 59	1 1/4	36 1/2 20 1/2
1 1/2	71 62	1 1/2	39 1/2 25 1/2
		1 3/4	43 1/2 28
		2	41 1/2 26

Skelp	
(F.o.b. Pittsburgh or Youngstown)	
Grooved	Per Lb. 1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods	
(Common soft, base)	
Pittsburgh	Per Gross Ton \$35.00
Cleveland	35.00
Chicago	36.00

COKE, COAL AND FUEL OIL

Coke	
Per Net Ton	
Furnace, f.o.b. Connellsville	\$1.75 to \$2.00
Prompt Foundry, f.o.b. Connellsville	2.50 to 4.00
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Philadelphia, delivered	8.50
Foundry, by-product, Cleveland, delivered	7.82
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal	
Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	\$1.00 to \$1.15
Mine run coking coal, f.o.b. W. Pa. mines	1.10 to 1.25
Gas coal, 1/4-in. f.o.b. Pa. mines	1.25 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.20 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.35
Gas slack, f.o.b. W. Pa. mines	0.35 to 0.45

Fuel Oil	
Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	3.25c.
No. 5 industrial fuel oil	2.65c. to 2.75c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.00c.
No. 4 industrial	4.50c.

REFRACTORIES

Fire Clay Brick	
Per 1000 f.o.b. Works	
High-heat Intermediate	\$38.00
Duty Brick	30.00
Penn.	35.00
Maryland	35.00
New Jer., \$44.00 to \$7.00	
Ohio	35.00
Kentucky	35.00
Missouri	35.00
Illinois	35.00
Ground fire clay, per ton	6.50

Chrome Brick	
Per Net Ton	
Standard size	\$42.50

Silica Brick	
Per 1000 f.o.b. Works	
Pennsylvania	\$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick	
Per Net Ton	
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

CAST IRON PIPE

Per Net Ton	
6-in. and larger, del'd Chicago	\$41.40
4-in., del'd Chicago	44.40
6-in. and larger, del'd New York	35.30
4-in., del'd New York	38.30
6-in. and larger, Birmingham	33.00
4-in., Birmingham	36.00

Class "A" and gas pipe, \$3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per Gross ton, f.o.b. Valley furnace:	
Basic	\$14.00
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	14.50
Low phosph., copper free	23.00

Freight rate to Pittsburgh or Cleveland district, \$1.89.

PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$14.50
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.50

Freight rates to points in Pittsburgh district range from 60c. to \$1.26.

CHICAGO

Per gross ton at Chicago furnaces:	
N'th'n No. 2 fdy.	\$15.50
N'th'n No. 1 fdy.	16.00
Malleable, not over 2.25 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	\$16.14 to 17.14
Low phosph., sil. 1 to 2, Copper free	25.00
Silvery, sil. 8 per cent	23.67
Bess. ferrosil' n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:	
Granite City, Ill.	\$15.50
Del'd St. Louis	16.35
N'th'n No. 2 fdy.	\$16.14 to 17.80
N'th'n malleable del'd	17.80
N'th'n basic, del'd	17.80
Southern fdy., sil. 1.75 to 2.25 del'd St. Louis	15.85

Freight rates 83c. (average) Granite City to St. Louis; \$2.30 from Chicago; \$4.56 from Birmingham.

NEW YORK

Per Gross ton, delivered New York district:	
*Buffalo, No. 2, del'd east	\$17.41
Buffalo malleable, del'd Eastern	17.91
N. J.	17.91
East Pa. No. 2 fdy.	15.02
East Pa. No. 2X fdy.	15.27

Freight rates: \$1.52 to \$2.63 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of \$3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:	
No. 2 fdy.	\$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

CINCINNATI

Per gross ton, delivered Cincinnati:	
Ala. fdy., sil. 1.75 to 2.25	\$15.82
Ala. fdy., sil. 2.25 to 2.75	16.07
Tenn. fdy., sil. 1.75 to 2.25	15.82
N'th'n No. 2 foundry	17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, \$2.02 from Ironton and Jackson, Ohio; \$3.82 from Birmingham.

CLEVELAND

Per gross ton at Cleveland furnace:	
N'th'n No. 2 fdy. (local delivery)	\$15.00
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent	21.75
Stand. low phosph., Valley	23.00
Southern No. 2 fdy.	\$16.14 to 17.14

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 63c. average local switching charge; \$3.00 from Jackson, Ohio; \$6.14 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:	
East Pa. No. 2	\$14.94
East Pa. No. 2X	14.84
East Pa. No. 1X	14.84
Basic (del'd east. Pa.)	14.09
Malleable	15.34
Stand. low phosph. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. br'g low phosph. (f.o.b. furnace)	20.00 to 21.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are del'd Philadelphia. Freight rates: 84c. to \$1.79 from eastern Pennsylvania furnaces; \$4.67 from Virginia furnaces.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:	
No. 2 fdy., 1.75 to 2.25 sil.	\$12.00
No. 2 soft, 2.25 to 2.75 sil.	12.54
Basic	12.00

NEW ENGLAND

Per gross ton delivered to most New England points:	
*Buffalo, sil. 1.75 to 2.25	\$19.05
*Buffalo, sil. 2.25 to 2.75	19.30
*Buffalo, sil. 1.75 to 2.25	18.03
*Buffalo, sil. 2.25 to 2.75	18.28
*Ala., sil. 1.75 to 2.25	\$15.64 to 16.64
*Ala., sil. 2.25 to 2.75	16.14 to 16.89

Freight rates: \$5.05 all rail from Buffalo, and \$3.66 to \$4.03 rail and water from Buffalo when \$1.25 barge and \$2.13 to New England freight rate are obtainable; \$5.64 rail and water from Alabama to New England seaboard.
*All-rail rate.
† Rail-and-water rate.

CANADA

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.60
No. 2 fdy., sil. 1.75 to 2.75	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	23.00 to 23.50

Ferromanganese

Per Gross Ton	
Domestic, 80%, seaboard	\$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	61.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$24.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	
10%	\$19.00
11%	19.50
12%	20.00
13%	20.50
Per Gross Ton	
14%	\$21.00
15%	21.50
16%	22.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	
6%	\$17.00
7%	17.50
8%	18.00
9%	18.50
10%	19.00
11%	19.50
Per Gross Ton	
12%	\$20.00
13%	20.50

Other Ferroalloys

Ferrotungsten, per lb. wo. del., car-loads	94c.
Ferrotungsten, less carloads	\$1.00

Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferromanganese, del. per lb. contained Va.	\$2.60 to \$2.80
Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn. base, per gross ton with \$2 unitage	50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
250% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ore, Delivered Locals	
Lake Ports	
Old range Bessemer, 51.5% iron	\$4.30
Old range, non-Bessemer, 51.5% iron	4.65
Mesabi Bessemer, 51.5% iron	4.65
Mesabi non-Bessemer, 51.5% iron	4.50
High phosphorus, 51.5% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

Per Unit	
Iron, low phosph., copper free, 55 to 58% iron, dry Spanish or Algerian	\$c. to 8.50c.
Iron, low phosph., Swedish, average	8c.
Iron, basic or foundry, Swedish, average, 65% iron	8c.
Iron, basic or foundry, Russian, aver. 65% iron (nom.)	9c.
Manganese, Caucasian, washed 52%	*28c.
Manganese, African, Indian, 50-52%	*21c. to 22c.
Manganese, Brazilian, 46 to 48%	*13c.
Per Net Ton Unit	
Tungsten, Chinese wolframite, duty paid	\$10.00
Tungsten, domestic scheelite	\$3.00 to \$10.00
Chrome, 45%, Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr ₂ O ₃ , c.i.f. Atlantic seaboard	18.00

*Quotations nominal in absence of sales.

Fluorspar

Per Net Ton	
Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois	\$11.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	13.50
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	\$16.00 to 16.75
Domestic, No. 1 ground bulk, 85 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	10.00 to 10.50
No. 2 railroad wrought	11.00 to 11.50
Scrap rails	11.00 to 11.50
Rails 3 ft. and under	12.50 to 13.00
Sheet bar crops, ordinary	12.00 to 12.50
Compressed sheet steel	11.25 to 11.75
Hand bundled sheet steel	10.00 to 10.50
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	8.25 to 8.75
Short shov. steel turnings	8.25 to 8.75
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron car wheels	10.00 to 10.50
Heavy breakable cast	9.00 to 9.50
No. 1 cast	9.50 to 10.50
Rail, knuckles and couplers	12.50 to 13.00
Rail, coil and leaf springs	12.50 to 13.00
Roller steel wheels	12.50 to 13.00
Low phosph. billet crops	13.00 to 13.50
Low phosph. sheet bar crops	13.00 to 13.50
Low phosph. plate scrap	12.50 to 13.00
Low phosph. punchings	12.50 to 13.00
Steel car axles	13.00 to 13.50

CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	\$9.00 to \$8.50
Shoveling steel	7.50 to 8.00

Hydraulic comp. sheets	\$6.00 to \$6.50
Drop forge flashings	5.50 to 6.00
No. 1 busheling	6.00 to 6.50
Roller car wheels	9.00 to 9.50
Railroad tires	9.00 to 9.50
Railroad leaf springs	9.50 to 10.00
Angle turnings	7.00 to 7.50
Steel couplers and knuckles	9.00 to 9.50
Coil springs	9.50 to 10.00
Angle turnings (elec. fur.)	7.50 to 8.00
Low phosph. punchings	9.50 to 10.00
Low phosph. plates, 12 in. and under	9.50 to 10.00
Cast iron borings	5.00 to 5.50
Short shoveling turnings	5.00 to 5.50
Machine shop turnings	4.00 to 4.50
Revolving rails	9.00 to 9.50
Steel rails, less than 3 ft.	9.00 to 9.50
Steel rails, less than 2 ft.	9.50 to 10.00
Angle bars, steel	8.50 to 9.00
Cast iron car wheels	8.50 to 9.00
Railroad malleable	8.50 to 9.00
Agricultural malleable	6.

No. 3 busheling	\$2.00 to \$2.50
Locomotive tire, smooth	7.50 to 8.50
Pipe and flues	1.25 to 1.75
No. 1 machinery cast	8.00 to 8.50
Clean automobile cast	8.00 to 8.50
No. 1 railroad cast	7.00 to 7.50
No. 1 agricultural cast	7.50 to 8.00
Stove plate	6.50 to 7.00
Grate bars	6.75 to 7.25
Brake shoes	7.00 to 7.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$8.00 to \$8.50
No. 2 heavy melting steel	6.50 to 7.00
No. 1 railroad wrought	11.00
Bundled sheets	4.00 to 4.50
Hydraulic compressed, new	5.00
Hydraulic compressed, old	5.00
Machine shop turnings	3.50 to 4.00
Heavy axle turnings	5.50 to 6.00
Cast borings	3.50 to 3.75
Heavy breakable cast	9.00 to 9.50
Stove plate (steel work)	7.00
No. 1 low phosph. heavy	10.00 to 10.50
Couplers and knuckles	9.00 to 9.50
Roller steel wheels	9.00 to 9.50
No. 1 blast furnace	3.50 to 3.75
Spec. iron and steel pipe	6.50 to 7.00
Shafting	12.00 to 13.00
Steel axles	12.00 to 13.00
No. 1 forge iron	5.50 to 6.00
Cast iron car wheels	9.50 to 10.00
No. 1 cast	10.00 to 10.50
Cast borings (chem.)	8.00 to 10.00
Steel rails for rolling	9.00 to 9.50

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$9.50 to \$10.00
No. 2 heavy melting steel	8.50 to 9.00
Compressed sheet steel	8.50 to 9.00
Light bundled sheet stampings	6.50 to 7.00
Drop forge flashings	8.00 to 8.50
Machine shop turnings	6.75 to 7.25
Short shoveling turnings	6.75 to 7.25
No. 1 busheling	7.50 to 8.00
Steel axle turnings	7.50 to 8.00
Low phosph. billet cross	10.00 to 11.00
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
No. 2 busheling	6.75 to 7.25
No. 3 busheling	10.00 to 10.50
Railroad grate bars	5.50 to 6.00
Store plate	8.50 to 9.00
Rails under 3 ft.	10.00 to 10.50
Rails for rolling	10.00 to 10.50
Railroad malleable	9.00 to 9.50
Cast iron car wheels	8.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' yards:	
No. 1 heavy melting steel	\$8.25 to \$8.75
No. 2 heavy melting steel	7.00 to 7.50
Scrap rails	7.00 to 7.50
New hydraulic comp. sheets	6.50 to 7.00
Old hydraulic comp. sheets	6.50 to 7.00
No. 1 busheling	7.00 to 7.50
Hvy. steel axle turnings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
Knuckles and couplers	9.00
Cast and leaf springs	9.00
Boiled steel wheels	7.00
Low phosph. billet cross	10.00 to 10.50
Short shov. steel turnings	5.50 to 6.00
Short mixed borings and turnings	3.75 to 4.25
Cast iron borings	3.75 to 4.25
No. 2 busheling	3.50 to 4.00
Steel car axles	10.00 to 11.00
Iron axles	10.00 to 11.00
No. 1 machinery cast	9.50 to 10.00
No. 1 cupola cast	9.00 to 9.50
Store plate	7.50 to 8.00
Steel rails, 3 ft. and under	10.00 to 10.50
Cast iron car wheels	8.00 to 9.00
Industrial malleable	7.00 to 7.50
Railroad malleable	8.00 to 8.50
Chemical borings	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$7.00 to \$7.50
Scrap steel rails	7.00 to 7.50
Short shoveling turnings	4.00
Store plate	8.00
Steel axles	9.00
Iron axles	9.00
No. 1 railroad wrought	4.50 to 5.00
Rails for rolling	4.50 to 5.00
No. 1 cast	8.00 to 8.50
Tramcar wheels	8.00
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$7.00 to \$7.50
No. 1 heavy melting	6.50 to 7.00
No. 2 heavy melting	6.00 to 6.50
Misc. stand-sec. rails	7.00 to 7.50
Railroad springs	7.75 to 8.25
Bundled sheets	2.00 to 2.50
No. 1 railroad wrought	7.00 to 7.50
No. 1 busheling	3.50 to 4.00
Cast iron borings and shoveling turnings	1.25 to 1.75
Rails for rolling	7.50 to 8.00
Machine shop turnings	1.25 to 1.75
Heavy turnings	3.00 to 3.50
Steel car axles	8.50 to 9.00
Iron car axles	11.00 to 11.50
Wrot. iron bars and trams	4.50 to 5.00
No. 1 railroad wrought	3.50 to 4.00
Steel rails less than 3 ft.	8.00 to 8.50
Steel angle bars	7.50 to 8.00
Cast iron car wheels	9.00 to 9.50
No. 1 machinery cast	7.00 to 7.50
Railroad malleable	6.00 to 6.50
No. 1 railroad cast	6.25 to 6.75
Store plate	6.50 to 7.00
Relay rails, 60 lb. and under	16.00 to 16.50

Relay rails, 30 lb. and over	\$20.00 to \$21.00
Agricult. malleable	4.00 to 4.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$4.25 to \$4.50
Scrap T rails	4.00 to 4.50
Machine shop turnings	1.75 to 1.90
Cast iron borings	1.25 to 1.50
Bundled skeleton, long	2.50 to 2.75
Shafting	6.25 to 6.75
Steel car axles	8.50 to 9.00
Wrought pipe	2.50 to 3.00
Rails for rolling	4.50 to 5.00
Cast iron borings, chemical	7.00 to 7.25

Per gross ton delivered consumers' yards:	
Textile cast	\$6.25 to \$6.50
No. 1 machinery cast	6.25 to 6.50
Store plate	3.25 to 3.50
Railroad malleable	7.50 to 8.00

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$5.00 to \$5.50
No. 2 heavy melting steel	3.50 to 4.00
Heavy melting steel (yard)	2.00 to 2.25
No. 1 heavy breakable cast	5.25 to 5.50
Store plate (steel work)	2.50 to 2.90
Machine shop turnings	1.50 to 2.00
Short shoveling turnings	1.50 to 2.00
Cast borings	1.50 to 2.00
No. 1 blast furnace	1.50 to 2.00
Steel car axles	8.50 to 9.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.85c
Reinforcing steel bars	2.60c
Cold-finished and screw stock	
Rounds and hexagons	2.95c
Squares and flats	2.45c
Hoops and bands, under 1/4 in.	2.95c
Hot-rolled annealed sheets (No. 24)	3.10c
25 or more bundles	3.10c
Galv. sheets (No. 24), 25 or more bundles	3.35c
Hot-rolled sheets (No. 10)	2.65c
Galv. corrug. sheets (No. 24), per square (less than 3750 lb.)	\$3.61
Spikes, large	2.40c
Small	2.65c
Boat	2.90c
Track bolts, all sizes, per 100 count	70 per cent off list
Machine bolts, 100 count	70 per cent off list
Carriage bolts, 100 count	70 per cent off list
Nuts, all styles, 100 count	70 per cent off list
Large rivets, base per 100 lb.	\$3.00
Wire, black, soft ann'd, base per 100 lb.	2.65
Wire, galv. soft, base per 100 lb.	3.10
Common wire nails, per keg	2.20
Cement coated nails, per keg	2.20

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

Base per Lb.	
Plates and structural shapes	3.00c
Soft steel bars and small shapes	2.75c
Reinforcing bars, billet steel	1.55c to 1.70c
Rail steel reinforcement	1.30c to 1.45c
Cold-fin. steel bars and shafting	
Rounds and hexagons	3.00c
Flats and squares	3.30c
Bands, 3/16 in. (in Nos. 12 and 14)	2.95c
Hoops (No. 14 gauge and lighter)	3.50c
Hot-rolled annealed sheets (No. 24)	3.45c
Galv. sheets (No. 24)	3.50c
Hot-rolled sheets (No. 10)	2.75c
Spikes (3/16 in. and lighter)	2.45c
Track bolts	4.30c
Rivets, structural (keg lots)	2.75c
Rivets, boiler (keg lots)	2.75c

Per Cent Off List

Machine bolts	65
Carriage bolts	65
Coupler and lag screws	65
Hot-pressed nuts, sq., tap. or blank	65
Hot-pressed nuts, hex., tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	80 and 10
Flat head bright wood screws	30 and 10
Springs cotter	60 and 10
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$4.50 off list
No. 8 black ann'd wire, per 100 lb.	\$3.45
Cement c'd nails, base per keg	2.30
Com. wire nails, base per keg	2.30

NEW YORK

Base per Lb.	
Plates and struc. shapes	3.10c
Soft steel bars, small shapes	3.10c
Iron bars	3.25c
Steel rails, 3 ft. and under	5.75c to 5.95c
Cold-fin. shafting and screw stock	
Rounds and hexagons	3.54c
Flats and squares	4.04c
Cold-rolled strip, soft and quarter hard	4.95c
Hoops	3.30c
Bands	3.30c
Hot-rolled sheets (No. 10)	2.60c
Hot-rolled ann'd sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.50c
Selling terms sheets (No. 24)	4.50c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.60c
Wire, galv. annealed (No. 10)	4.05c
Tire steel 1/4 x 1/2 in. and larger	3.40c
Smooth finish, 1 to 3/4 x 1/2 in. and larger	3.75c

Spec. iron and steel pipe	\$3.00 to \$3.25
Forge fire	2.75 to 3.00
No. 1 railroad wrought	4.00 to 4.50
No. 1 yard wrought long	3.25 to 3.50
Rails for rolling	5.00 to 5.50
No. 1 cast	4.50 to 5.00
No. 2 cast	5.00 to 5.50
Stove plate (foundry)	4.50
Cast borings (small)	6.00 to 6.25
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$9.00
No. 1 hvy. cast (cupola size)	7.50 to 8.00
No. 2 cast	5.00 to 5.50

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$6.00 to \$6.50
Scrap rails for melting	6.75 to 7.25
Loose sheet clippings	1.50 to 2.00
Bundled sheets	4.25 to 4.75
Cast iron borings	3.25 to 3.75
Machine shop turnings	3.00 to 3.50
No. 1 busheling	4.50 to 5.00
No. 2 busheling	2.75 to 3.25
Rails for rolling	7.25 to 7.75
No. 1 locomotive tires	7.25 to 7.75
Short rails	9.50 to 10.00
Cast iron car wheels	6.75 to 7.25
No. 1 machinery cast	6.75 to 7.25
No. 1 railroad cast	6.25 to 6.75
Burnt cast	4.25 to 4.75
Stove plate	4.50 to 5.00
Agricultural malleable	7.25 to 7.75
Railroad malleable	7.50 to 8.00

DETROIT

Dealers' buying prices per gross ton:	
Hvy. melting steel	\$7.50 to \$8.00
Borings and short turnings	5.50 to 6.00
Long turnings	4.25 to 4.75
No. 1 machinery cast	7.75 to 8.25
Automotive cast	9.50 to 10.00
Hydraulic comp. sheets	7.25 to 7.75
Stove plate	3.50 to 4.00
New No. 1 busheling	5.50 to 6.00
Old No. 2 busheling	4.00 to 4.50
Sheet clippings	3.00 to 3.50
Flashing	5.00 to 5.50

CANADA

Dealers' buying prices per gross ton:	
	Toronto Montreal
Heavy melting steel	\$7.00 \$6.00
Rails, scrap	7.00 6.00
No. 1 wrought	6.00 5.00
Machine shop turnings	2.00 2.00
Boiler plate	5.00 4.50
Heavy axle turnings	2.00 2.00
Cast borings	2.00 2.00
Steel borings	2.00 2.00
Wrought pipe	2.00 2.00
Steel axles	7.00 6.00
Axles, wrought iron	7.00 11.00
No. 1 machinery cast	12.50 10.00
Stove plate	10.00 8.00
Standard car wheels	10.00 8.50
Malleable	10.00 8.00

Open hearth spring steel, bases	4.50c to 7.00c
Common wire nails, base, per keg	\$2.60
Machine bolt, cut thread:	Per Cent Off List
1/4 x 6 in. and smaller	.65 to .65 and 10
1/2 x 30 in. and smaller	.65 to .65 and 10
Carriage bolts, cut thread:	
1/4 x 6 in. and smaller	.65 to .65 and 10
1/2 x 20 in. and smaller	.65 to .65 and 10
Boiler tubes:	Per 100 Ft.
Seamless welded, 2-in.	19.34
Lap welded, 2-in.	\$18.05
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	\$24.68

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
Cold-fin. rounds, shafting, screw stock	3.30c
Hot-rolled annealed sheets (No. 24)	3.70c
Galv. sheets (No. 24)	4.00c
Hot-rolled sheets (No. 10) up to and inc. 48 in. wide	3.00c
over 48 in. wide	3.15c
Black corrug. sheets (No. 24)	3.75c
Galv. corrug. sheets	4.05c
Structural rivets	4.00c
Boiler rivets	4.00c

Per Cent Off List

Tank rivets, 7/16 in. and smaller	65
Less than 100 lb.	60
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex., blank or tapped, 00 lb. or more	65
Less than 200 lb.	55

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.45c
*Structural shapes	2.45c
*Soft steel bars, small shapes, iron bars (except bands, sq., twisted and deformed)	2.45c
Reinforcing steel bars, sq., twisted and deformed	2.30c
Cold-finished squares and flats	3.35c
*Steel hoops	3.00c
*Steel bands, No. 12 to 3/16 in., incl.	2.75c
Spring steel	5.00c
Hot-rolled annealed sheets (No. 24)	3.15c
Galvanized sheets (No. 24)	3.50c
*Hot-rolled annealed sheets (No. 10)	2.70c
Diam. pat. floor plates, 1/4 in.	5.00c
Swedish iron bars	6.00c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

* Base prices subject to deductions on orders aggregating 4000 lb. or over.

† For 50 bundles or over.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	2.95c
Soft steel bars	2.75c
Reinforcing steel bars	1.75c to 1.95c
Flat rolled steel under 1/4 in.	2.90c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.50c
Hot-rolled sheets (No. 10)	3.00c
Black ann'd wire, per 100 lb.	\$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.10

* Net base, including boring and cutting to length.

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
New billet reinforcing bars	3.00c
Rail steel reinforcing bars	3.00c
Hoops	3.90c
Bands	2.20c
Cold-fin. rounds and hex.	3.22c

Squares and flats	3.52c
Hot-rolled annealed sheets (No. 24)	3.75c
Galv. sheets (No. 24)	3.85c
Hot-rolled sheets (No. 10)	3.30c
Structural rivets	4.30c
Small rivets	.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

United States Smelting, Refining & Mining Co., 57 William Street, New York, has approved plans for new lead refining plant at Midvale, Utah, to be operated in conjunction with smelter at that place. Cost over \$400,000 with machinery. Executive offices are at 1 State Street, Boston.

Peter Doelger Brewing Corp., 84 Forrest Street, Brooklyn, is establishing new brewery at Amsterdam Avenue and 128th Street, New York, and will concentrate production at that location in future. Brooklyn plant will be discontinued and certain machinery removed to new location.

Commercial Body Works, Inc., Brooklyn, has been organized by Myron B. Willner, 881 East Twelfth Street, and associates, to manufacture commercial automobile bodies and operate body repair works.

North American Brewing Co., Wilson and Greene Avenues, Brooklyn, has awarded general contract to Caye Construction Co., 356 Fulton Street, for three-story addition. Cost over \$60,000 with equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until May 15 for about 220,000 ft. cable and reels (Circular 108).

Endlein Engineering Corp., New York, has been organized by Carl Endlein, Sr. and Jr., 462 East Twenty-second Street, Brooklyn, to manufacture machinery and parts.

Quartermaster Supply Officer, Army Base, Brooklyn, asks bids until May 8 for one motor-driven band saw machine, one tilting machine, one electric-operated conveyor, storage batteries, etc. (Circular 151); until May 15, 150 galvanized iron cans, 50 electric floor polishers, electric range and other supplies (Circular 153).

Ford Motor Co., Dearborn, Mich., has resumed production at branch assembling plant at Green Island, near Troy, N. Y., on five-day week schedule, recalling about 170 men. Plant has been inactive since December.

United States Rubber Products, Inc., Broadway and Fifty-eighth Street, New York, a subsidiary of United States Rubber Co., same address, has leased part of factory of Syracuse Chilled Plow Co., Syracuse, N. Y., about 52,000 sq. ft. floor space, for new branch plant.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until May 11 for 300 180-cu. ft. capacity steel acetylene cylinders (Proposal 43433), 200 88-cu. ft. capacity acetylene cylinders (Proposal 43434), five acetylene buoy bodies and one lighted gas bell buoy body (Proposal 43361).

New Amsterdam Brewing Co., 10 East Fortieth Street, New York, is considering new multi-story brewery near Baltimore or Washington. Cost over \$1,000,000 with equipment. Badgley & Wood, 101 Park Avenue, New York, are architects.

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until May 10 for nickel forgings (Circular 40).

General Electric Co., Schenectady, N. Y., is increasing operations at electric refrigerator plants, placing Fort Wayne, Ind., works, on six-day week day and night basis, doubling working quota; Erie, Pa., plant is on full time, with 50 per cent increase in operating force; Schenectady plant is running full time with full working quota.

Christian Feigenson Corp., 50 Freeman Street, Newark, N. J., plans expansion at brewing plant, with installation of bottling machinery and other equipment. Cost over \$100,000.

Bamberger Broadcasting Co., 147 Market Street, Newark, N. J., is arranging for purchase of 20 acre tract in Riverside Park district, East Rahway, N. J., as site for new high-power broadcasting plant, with steel towers, power station and other structures. Cost about \$200,000 with equipment.

Department of Supplies, Board of Education, 31 Green Street, Newark, Alfred H. Krick, secretary, asks bids until May 10 for metal-working and wood-working machinery, warehouse trucks, steam tables, work benches, steel lockers, iron and steel, printing machinery and other equipment and supplies.

Diana Properties, Inc., Ridgefield, N. J., manufacturer of industrial chemicals, etc., let general contract to W. J. Lange, Inc., 1025

Hoyt Avenue, for one-story addition, including improvements in present factory. Cost over \$65,000 with equipment. C. G. Mettberg, 16 Depot Square, Englewood, N. J., is architect.

Standard Sanitary Mfg. Co., 18 East Forty-fifth Street, New York, manufacturer of sanitary ware, is resuming operations at plant at Hamilton Township, Trenton, N. J., following curtailment for several months, recalling about 300 employees.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 9 for aluminum alloy propeller blades and hubs (Schedule 9952) for Philadelphia Navy Yard.

Pennsylvania Forge Corp., Milnor and Bleigh Streets, Philadelphia, manufacturer of iron and steel forgings, etc., has purchased 12-acre tract on Wissinoming Street, Bleigh to Shelmire Streets, improved with group of industrial buildings, for about \$200,000, and will use for expansion.

Hassel & Lauer Brewing Co., Reading, Pa., is considering extensions and improvements, including additional equipment. Cost over \$65,000 with machinery.

Eaton, Dikeman Co., Lee, Mass., operating paper mill, has purchased mill of Holly Gap Paper Co., Mount Holly Springs, Pa., idle for several years. Unit will replace mill of purchasing company at Lee, destroyed by fire a few months ago. Cost over \$70,000.

◀ CENTRAL DISTRICT ▶

Pittsburgh Brewing Co., 3340 Liberty Avenue, Pittsburgh, plans improvements and modernization of Eberhardt & Ober Brewery, Troy Hill Road, including additional equipment. Cost over \$60,000.

Furo Rubber Co., West Jannette, Pa., W. Kline, general manager, recently organized by Mr. Kline and associates, has acquired former local mill of Nu-Cord Rubber Co., for manufacture of automobile tires and tubes and other rubber products.

Ben Franklin Coal Co., Moundsville, W. Va., has authorized new steam-operated electric power plant, 60 x 90 ft., with installation of steam turbo-generators, boilers, stokers and auxiliaries. Cost over \$80,000 with equipment.

Greensburg Brewing Co., Alwine Avenue, Greensburg, Pa., asks bids early this month for three-story addition, 34 x 75 ft. Cost over \$85,000 with machinery. R. J. Brocker, Coulter Building, is architect and engineer.

Clarksburg Ice & Storage Co., Clarksburg, W. Va., has plans for extensions and improvements in brewery, including new equipment. Cost about \$150,000 with machinery. W. M. B. Sine, head of company is forming new corporation to operate brewery. Ford, Bacon & Davis, Inc., 39 Broadway, New York, is consulting engineer.

Cleveland Home Brewing Co., 2501 East Sixty-first Street, Cleveland, has plans for two one-story additions and improvements in present brewery, including additional equipment. Cost about \$40,000 with machinery.

Washington Breweries Co., Second Avenue and Perry Street, Columbus, Ohio, is planning expansion and improvements at brewing plants with installation of additional equipment. General contract has been let to Boyajohn & Barr Co., 299 South Front Street, for two-story addition, 40 x 100 ft., as part of program. Company has arranged financing in amount of \$500,000, part of fund to be used for purpose noted.

American Metal Cap Co., Toledo, Ohio, care of Harry Levison, Spitzer Building, representative, has been organized by Samuel B. Stone, Toledo, and associates, to manufacture metal bottle caps and kindred metal goods.

City Council, Eaton, Ohio, plans municipal electric distributing system. Cost over \$50,000 with equipment. Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is consulting engineer.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until May 9 for 70 runway marker lamp assemblies (Circular 555); until May 10, 260 panel instrument boards (Circular 556), four vibration stand assemblies (Circular 558); until May 15, 264 gun-control switch assemblies, 124 gun-charging control assemblies and 200 gun-charging handle assemblies (Circular 547), 250 gun type mount assemblies (Circular 534), 800 altimeter assemblies (Circular 540), 100 target glider assemblies and 10 mount as-

semblies (Circular 539); until May 16, 96 four-wheel trailers (Circular 549), 307 drift meter assemblies (Circular 541), 5000 control pulleys (Circular 550); until May 17, airplane nuts (Circular 545); until May 22, 185 compass assemblies (Circular 553); until May 23, steel aircraft bolts (Circular 562).

Alliance Brewing Co., Alliance, Ohio, heretofore owned and operated by Alliance Ice & Coal Co., has been acquired by new interests. Plans are under way for expansion and modernization, including additional equipment. Cost over \$50,000 with machinery.

August Wagner & Sons, 605 South Front Street, Columbus, Ohio, plan extensions and modernization in branch brewery at Chillicothe, Ohio, with additional brew house, bottling, conveying and other machinery, tanks, etc. Cost over \$45,000. Bassett & Tresselt, 257 East Broad Street, Columbus, are architects.

Hoosier Friction Products Corp., North Manchester, Ind., has been organized by C. B. and L. B. DeLancey, North Manchester, to manufacture clutch blocks, brake blocks and allied mechanical products.

Marlin Oil Co., Washington, Ind., is considering new bulk oil storage and distributing plant, with tanks, pumping machinery and auxiliary equipment. Cost about \$35,000.

Department of Public Works, Lansing, Mich., has tentative plans for new municipal refuse and garbage incinerator plant. Cost over \$75,000 with equipment.

Austin Trailer Equipment Co., 2999 Lake Shore Drive, Muskegon, Mich., has been organized by O. A. Seyferth, Lake Harbor, Mich., and associates, to manufacture truck trailers and equipment, parts, etc.

Schols Tool & Machine Co., Grand Rapids, Mich., has acquired Rearwin Patented Sawing & Filing Machine Co., with local plant, and will consolidate. Purchasing company plans expansion for manufacture of filing machines and other equipment heretofore made by Rearwin company.

West Side Brewing Co., Grand Rapids, Mich., recently organized, has engaged Donald Lakie, Grand Rapids, architect, to prepare plans for expansion and modernization of local plant of Peterson Brewing Co., acquired by West Side company. Cost about \$150,000 with equipment.

General Motors Corp., Detroit, as a result of action taken by stockholders of General Aviation Corp. and North American Aviation, Inc., now becomes dominating factors in North America Aviation, Inc., and its wholly owned subsidiaries—General Aviation Mfg. Corp., B/J Aircraft Corp. and Eastern Air Transport, Inc. North American Aviation, Inc. also has substantial interests in Douglas Aircraft Co., Inc., Western Air Express Corp., and Transcontinental Air Transport, Inc. Latter two companies each hold a 47½ per cent interest in Transcontinental and Western Air, Inc.

Towsley Co., Inc., recently incorporated by S. M. Blackburn and J. J. Taylor, is operating at Appleton and Robertson Streets, Cincinnati, manufacturing a full line of industrial trucks. This company bought entire truck division of John T. Towsley Mfg. Co. S. M. Blackburn was formerly connected with Morris Machine Tool Co., and J. J. Taylor with Stacey Brothers Gas Construction Co.

◀ NEW ENGLAND ▶

Marggraf Brothers, 14 Houston Avenue, Methuen, Mass., brewers, have plans for extensions and improvements in brewery at Bradford, Mass., including additional equipment. Cost over \$40,000 with machinery. Carl F. Hettinger, 20 Ainsworth Street, Roslindale, Mass., is architect.

Display Light Mfg. Co., Bridgeport, Conn., has been organized by I. T. and Harry Cohn, 1188 Main Street, capital \$100,000, to manufacture electric lighting equipment, fixtures and devices.

New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, steel balls, etc., has advanced production schedule at branch plant at Meriden, Conn., reinstating about 300 employees.

Hamilton Brewery Co., Central and Jackson Streets, Lowell, Mass., has plans for extensions and modernization in four-story brewery, 135 x 270 ft., with installation of additional equip-

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Being an expert driver of an automobile does not make one an expert designer and builder of motor cars nor does being an expert manufacturer of metal articles make one an expert in the design and construction of the machinery required to obtain highest production at lowest cost.

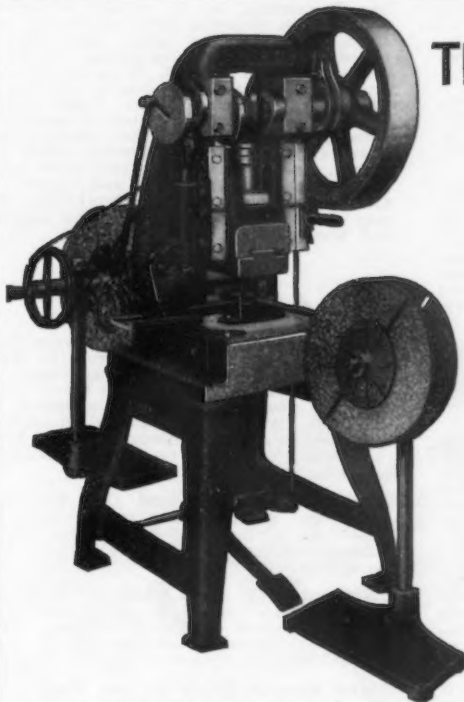
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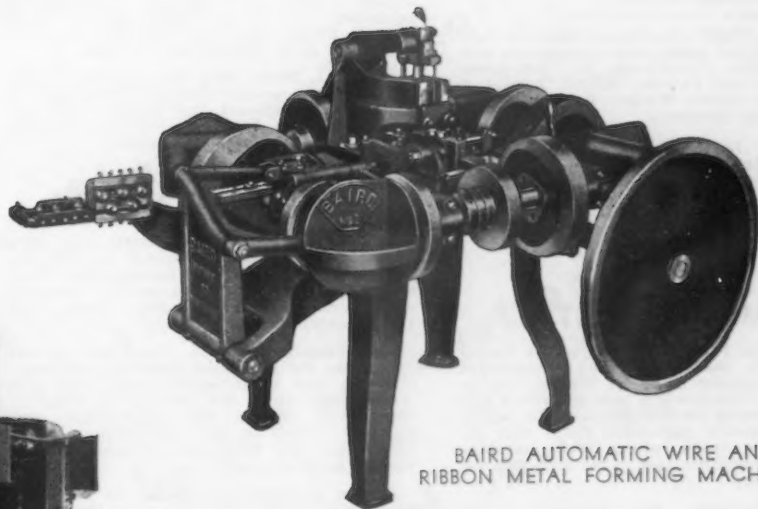
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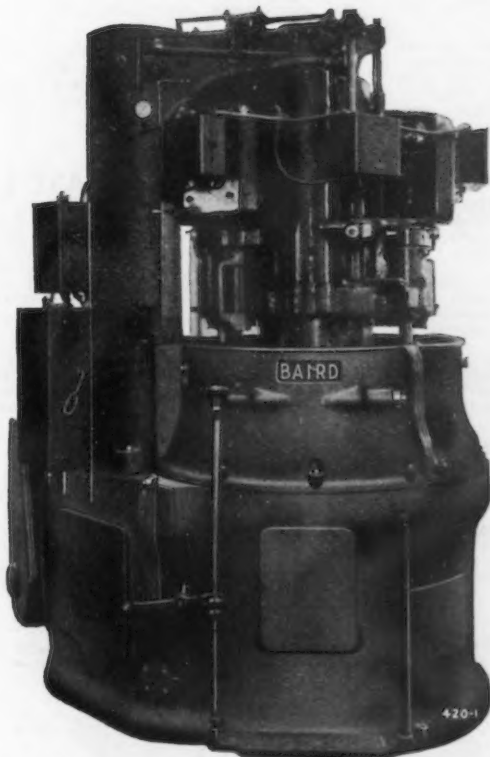
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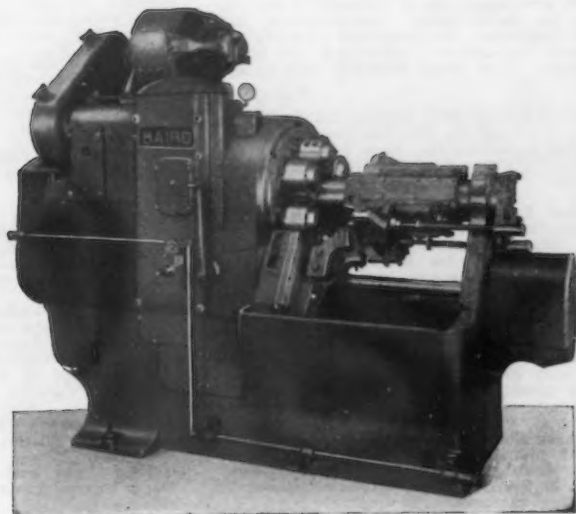
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BAIRD AUTOMATIC MULTIPLE SPINDLE INTERNAL GRINDERS



BAIRD AUTOMATIC HORIZONTAL AND VERTICAL MULTIPLE SPINDLE LATHES

ment. Cost about \$50,000 with machinery. C. F. Hettinger, 20 Ainsworth Street, Roslindale, Mass., is architect.

P. H. O'Brien Co., Derby, Conn., has been organized by Patrick H. O'Brien, O'Brien Place, and Peter E. Wilkins, 6 Elizabeth Street, to manufacture tools and machine parts.

Old New England Brewing Co., Derby, Conn., recently chartered by Philip J. Walsh and M. E. Hausser, both Hartford, Conn., has leased plant and property of Southern New England Ice Co., Derby, and will remodel for new plant. Plans have been completed for additions for brew house and bottling works. Cost over \$80,000 with machinery.

◀ SOUTH CENTRAL ▶

United States Engineer Office, Memphis, Tenn., asks bids until May 11 for two heavy duty hauling winches (Circular 548).

A. E. Crum, 222½ Milam Street, Shreveport, La., is at head of project to erect local brewery, with initial capacity of about 2000 bbl. a month. Cost close to \$100,000 with machinery. Company will be organized to carry out work.

Stitzel Distilling Co., 1035 Story Avenue, Louisville, has plans for addition to double present capacity, including installation of tanks and other equipment. Cost over \$70,000 with machinery. C. J. Epping, 806 East Broadway, is architect.

Board of Trustees, Owenton, Ky., asks bids until May 12 for two electric-operated pumping units and auxiliaries, elevated steel tank and tower, and other equipment for water supply system. C. N. Harrub Engineering Co., American National Bank Building, Nashville, Tenn., is consulting engineer.

Louisville Water Co., Louisville, will take bids soon for two steam turbo-generators, condensers, piping, switchboard, etc., for power house. Cost over \$50,000. Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, are consulting engineers.

Falls City Ice & Beverage Co., Broadway and Thirty-first Street, Louisville, has authorized plans for four-story addition to brewing plant, with installation of tanks, mechanical cooling and other equipment. Cost over \$200,000 with machinery. C. W. Wagner is company engineer.

◀ MIDDLE WEST ▶

Allied Mills, Inc., 141 West Jackson Boulevard, Chicago, has engaged Indiana Engineering & Construction Co., Fort Wayne, Ind., to prepare plans for new soy bean processing and oil-manufacturing plant at Norfolk, Va., where site was recently acquired. Plant will include storage tanks, power house, machine shop and other structures. Cost over \$350,000 with machinery.

Capitol Breweries, Inc., Chicago, E. C. Kramp, president, care of Richard C. Day, 10 South La Salle Street, representative, recently organized, has acquired property at Hartland, Ill., and will convert for new brewing plant. Cost about \$100,000 with equipment.

Midland Iron & Steel Corp., 215 Twentieth Street, Rock Island, Ill., has been organized by Irving J. Livingston, Rock Island, and associates, to manufacture iron and steel products.

Skelgas Co., 4645 Humboldt Avenue North, Minneapolis, a subsidiary of Skelly Oil Co., Tulsa, Okla., has plans for one-story propane gas filling plant, for bottling bulk gas in steel containers, retorts, etc., 35 x 100 ft. Cost about \$90,000 with equipment. Company architectural department, 2534 Madison Street, Kansas City, Mo., in charge.

Superintendent, Genoa Indian School, Genoa, Neb., asks bids until May 8 for one screw-cutting precision lathe, one drill press, and one electric oilstone grinder.

Common Council, Winfield, Iowa, plans erection of municipal electric light and power plant. Cost about \$70,000 with equipment. Young & Stanley, Inc., Muscatine, Iowa, is consulting engineer.

Paper Boards, Inc., Chicago, recently organized by E. L. Harding, Chicago, and associates, has acquired boxboard mills of Kellogg Paper Products Co., Taylor and Rockwell Streets, 126 x 276 ft., for new plant. Expansion and improvements are planned.

Elgin Eagle Brewing Co., Elgin, Ill., let general contract to Burrill Construction Co., 1014 North Raynor Avenue, Joliet, Ill., for extensions and improvements in plant, including new machinery. Cost about \$150,000 with equipment.

Garden City Brewing Co., Missoula, Mont., C. S. McNair, general manager, is considering plant extensions and improvements, including additional equipment. Cost over \$40,000 with machinery.

Engineering & Management Co., 4441 Fillmore Street, Chicago, has purchased business of Guyton & Cumfer Mfg. Co., which for more than 20 years was a leading manufacturer of roofing machinery. Purchasing company will carry on manufacture of Guyton & Cumfer products, together with other items, such as paper machinery, box board machinery, steam jacketed pumps and fittings.

Modern Auto Parts Mfg. Co., 117 North Eighth Street, Sheboygan, Wis., is taking bids for machine shop addition, 30 x 70 ft., part two stories and basement. W. C. Weeks, 720 Ontario Avenue, is architect.

Milwaukee Pump & Tank Co., Milwaukee, has been organized by Charles D. Ashley, 757 North Broadway, and associates, who have acquired assets of bankrupt Milwaukee Tank Works, Inc., 728 East Nash Street, at trustee's sale and will continue manufacture of filling station equipment.

Jorgensen Taper Tool Mfg. Co., Beloit, Wis., has been organized to manufacture new type of taper tool designed by James P. Jorgensen for use in production of tapered articles, such as golf club shafts, billiard cues, fishing rods, etc. Production will be carried on at Jorgensen machine shop, 624 Third Street.

Edgerton, Wis., Common Council closes bids May 13 for erection and equipment of new sewage disposal system and plant, including three motor-driven pumps, two clarifier mechanisms of flight conveyor type, sludge heating equipment, etc. W. G. Kirchhoffer, 22 North Carroll Street, Madison, Wis., is consulting engineer. A. I. Teisberg is city clerk.

George J. Meyer Mfg. Co., Cudahy, suburb of Milwaukee, manufacturer of bottle washing and filling equipment, has recalled 200 men on orders from brewers. Six hundred men are engaged in three 8-hr. shifts.

◀ SOUTH ATLANTIC ▶

Standard Auto & Truck Parts Co., Inc., Baltimore, has been organized by Maurice Patz and associates, to manufacture truck and commercial automobile parts. Company will succeed to Standard Auto Parts, Inc., 1836 Pennsylvania Avenue.

City Council, Danville, Va., has surveys under way for municipal hydro-electric power plant on Dan River, near Stuart, Va., with transmission lines for service at Danville, Martinsville, Stuart and neighboring communities. Cost about \$2,000,000. Frank Daugherty, 160 Greenwood Avenue, Jenkintown, Pa., is engineer.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until May 10 for elevator hoistway and car enclosures with doors, collapsing gate, electric interlocks, etc., at local navy yard (Specification 7308).

Board of District Commissioners, District Building, Washington, asks bids until May 8 for 100-kva. transformers and accessories for penal institute; until May 18, 29,000 ft. lead-covered cable.

Swift & Co., Chicago, meat packers, have plans for one-story addition to branch plant at Savannah, Ga. Cost about \$50,000 with equipment.

Cloverdale Brewing Co., Bolton Street, Baltimore, has plans for extensions and improvements, including additional equipment. Cost over \$85,000 with machinery.

General Purchasing Officer, Panama Canal, Washington, asks bids until May 10 for four manganese steel dredge dipper lips, malleable iron pipe fittings, 14 transformers, knife switches, 5000 lb. steel spikes, etc. (Schedule 2859).

City Manager's Office, City Hall, Winchester, Va., P. P. Pilcher, city manager, asks bids until May 12 for equipment for municipal electric light and power plant, including Diesel engine generator unit and other machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 9 for five motor-driven engine lathes (Schedule 9946) for Norfolk, Mare Island, Eastern and Western navy yards; 3600 aluminum powder tanks and 33,406 aluminum cartridge

tanks (Schedule 9975) for Hingham, Mass., and Portsmouth, N. H.; yards; carpenters' folding rules (Schedule 9974) for Boston, San Diego, Brooklyn and other yards; boiler gaskets (Schedule 9949) for Eastern and Western yards; until May 16, 12 turbo-generator sets and spare parts (Schedule 6) for Boston, Philadelphia, Brooklyn and Puget Sound yards; 12 electro-hydraulic steering gears and spare parts, and 12 electro-hydraulic windlasses and spare parts (Schedule 9962) for Boston, Brooklyn and other yards; 996 hand shovels (Schedule 9992), brass and copper pipe and copper tubing (Schedule 9991), steel figures and letters (Schedule 9987) for Eastern and Western yards.

◀ SOUTHWEST ▶

County Urban Water District, Kansas City, Mo., care of W. Malcolm Lowry, 114 West Tenth Street, president, plans installation of electric pumping plants, pressure towers, pipe lines, etc., for water distributing system in Clay and Platte counties, for which surveys have been made. Cost about \$400,000. Henric-Lowry Engineering Co., address noted, is consulting engineer.

Excelsior Producers Coal Co., Excelsior, Ark., plans expansion and improvements at Mine No. 2, including mining machinery, hoisting and conveying equipment, industrial locomotives, etc.

National "70" Corp., Lincoln, Neb., oil products, plans new bulk oil storage and distributing plant at Springfield, Mo., with steel tanks, pumping machinery, etc. Cost over \$35,000 with equipment.

West Memphis Cotton Oil Co., West Memphis, Ark., plans new cottonseed oil mill of several units. Cost over \$100,000 with machinery. W. H. Jasson is head of project.

City Council, Cushing, Okla., J. W. Flint, city manager, plans early call for bids for engine-generator units, exciters, transformers, crane and other equipment, including electric distributing equipment, for municipal electric light and power plant and system. Cost about \$200,000.

Southeast Missouri Cotton Compress Co., Caruthersville, Mo., N. W. Helm, president, plans new cotton compress plant at Hayti, Mo., with installation of compressors and other mechanical equipment. Cost about \$50,000 with machinery.

Quartermaster Supply Officer, Fort Sam Houston, Texas, asks bids until May 9 for about 85,000 lb. iron animal shoes (Circular 191); until May 10, wire nails, machine bolts, flat steel sheets, reinforcing steel, etc. (Circular 62).

City Council, Plainview, Tex., will have plans drawn by Montgomery & Ward, Wichita Falls, Tex., consulting engineers, for municipal electric light and power plant. Fund of \$450,000 authorized for project.

◀ PACIFIC COAST ▶

Oregon Breweries & Hopyards Affiliated, Inc., American Bank Building, Portland, James E. Edmiston, president, recently organized by Mr. Edmiston and associates, is planning new brewery, with initial capacity of 100,000 bbl. a year. Cost over \$300,000 with machinery. C. H. Eisman is secretary and treasurer.

Pacific Brewing & Malting Co., 943 Russ Building, San Francisco, has awarded general contract to Cahill Brothers, 206 Sansome Street, for additions and improvements in brewery at San Jose, Cal. Cost about \$85,000 with equipment. W. P. Day, Financial Center Building, San Francisco, is architect.

Superintendent, Phoenix Indian Sanatorium, Phoenix, Ariz., asks bids until May 10 for one power-operated pipe cutting and threading machine, for pipe ½- to 2-in. diameter.

Manning Gold Mines, Inc., Manning, Utah, W. J. Franklin, superintendent, is planning new milling plant. Cost over \$100,000 with machinery.

Olympia Brewing Co., Olympia, Wash., Adolph Schmidt, president and technical director, has plans for two-story brew house, 140 x 185 ft., one-story bottling plant, 60 x 120 ft., refrigerating plant, power house and storage and distributing plant at Tumwater, near Olympia. Cost about \$275,000 with machinery.

Pilsener Brewing Co., Alaska Building, Seattle, L. B. Schwellenback in charge, has plans for new local brewery. Cost over \$100,000 with equipment. Konrad Lux is engineer.

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used in this ventilating
system in a New York
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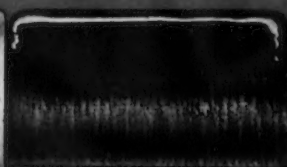
How 90 lb. blocks of Tycol *effect savings in*

OLD



Inefficient lubrication with hand molded grease.

NEW



Perfect lubricating film with Tycol Roll Neck Block Greases.

OLD

Before using Tycol Block Grease, hand molding produced this effect. Time was wasted. Bearing losses were high. Lubrication was far from perfect and much grease was lost because the hand packing failed to produce a perfect lubricating film.

NEW

After using Tycol Block Grease, a slab, cut without waste, gave perfect lubrication right up and into the fillet. Every ounce of grease lubricated. Power was saved, bearing losses were minimized and uniform thickness of rolling was assured.



90 lb. blocks of Tycol Tal-low Base Roll Neck Grease as manufactured by Tide Water for convenience and economy in roll neck lubrication.

of Tycol Plastic Greases in roll neck lubrication

HAND MOLDING is banished by Tycol 90 lb. grease blocks. The costly danger of unlubricated sections on the roll neck surface is eliminated. And the waste due to grease dropping or being washed unused into the scale pit disappears.

When Tycol Roll Neck Grease is used, a slab is cut from the 90 lb. block, laid in place, and the job is done. The lubricant is in contact with the entire length of the roll neck right up and into the fillet. Perfect lubrication is assured and every bit of the grease is used.

And Tycol Greases are so compounded that cooling water will not affect the lubricating value nor wash away the grease.

In addition, the 90 lb. blocks cost no more per pound, are more convenient to use and the waste experienced in barrel packed grease is entirely eliminated. The lubricating oil is 100% paraffine base, compounded so uniformly that perfect duplication of economical performance is always assured. Small wonder that mill superintendents and master mechanics who buy Tycol Roll Neck Greases will accept no substitutes.

We are willing to prove our claims. Let us send you a trial order. Give it your hardest lubricating job. Then judge for yourself.

TIDE WATER OIL SALES CORPORATION
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The blocks are easily cut by a wire. There's no waste and no hand molding.



Here's a block cut up ready for use. 90% of all cold roll necks using hand packed grease can be served by Tide Water Roll Neck Block Greases.

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Compressor Oils	Hydraulic Turbine Oils
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THE IRON AGE

PRODUCTION ■ MANAGEMENT ■ PROCESSES ■ NEWS

Plastic Molding at Cutler-Hammer Plant

(Concluded from Page 699)

can be refilled while the other is being used to fill the mold.

To start the process the operator fills a pan with slightly less than the amount of material needed, and then places the pan on the scales which actuate a switch to start the screw feed motor. As soon as the scale tips, the switch contact is broken, the motor stops and the gate closes to trap any material left in the screw housing. This automatic weighing operation goes on while a part is being molded. The operator then partly fills the other pan and puts it in on the scale in the place of the weighed pan and the cycle of weighing is repeated.

All machine operations are performed on cold molded parts before they are cured. It is seldom that a mold for cold work on large production is designed to make an open hole. It has been found a thin web of material is more easily and satisfactorily punched or drilled out than is the operation of taking out a fin.

Interesting examples of machine work are afforded by several automatic machines. One of these is designed with a vertical feed disk, in the rim of which are mounted cold molded knobs. As the disk rotates the tops of the knobs are polished by coming in contact with a belt. Over 2000 knobs are polished in an hour. Another machine with a horizontal feed plate grooves, broaches and cleans the tops of 1800 pieces in an hour.

Curing Temperatures

Following operations similar to the above, parts are placed on metal buggies preparatory to curing. If there is a possibility of parts warping when heat is applied they are strapped to the buggies. Parts made with materials in which inorganic binders are used go to a steam digester, where they are held in steam at 100 lb. per sq. in. for about 24 hr. Those parts in which an organic binder was used go to indirect gas-fired ovens where, depending on the character of the material and the design of the part, temperatures range upward to 400 deg. F. and curing time ranges from 2 to 100 hr. A special device, designed and built by Cutler-Hammer, controls the rate of temperature rise in the ovens according to a predetermined schedule.

At the end of the curing period the buggies are rolled out under a glass-topped canopy for cooling. When cold the parts are tumbled, polished or ground as specified. Fins are scratched or brushed off. The tumbling operation gives a polish to the parts before final inspection.

A very interesting development with regard to the hot molding process lies in the fact that the steam pressure together with its corresponding temperature, available from the

central power plant, is too low when it reaches the molding plant. The idea of installing a separately fired superheater or a separate boiler was given up and instead there were installed two motor-driven horizontal, single-stage compressors in which steam is raised from 110 lb. to 150 lb. per sq. in., at which pressure it is used in the hot molds except when a lower temperature is wanted and then the pressure is dropped at the press by means of a reducing valve. Curing time is automatically indicated by a special clock on each press which starts with the press and returns to zero when the piece is ejected from the mold.

One Operator Handles Three Hot Presses

As a general rule one operator cares for three hot presses, this being possible because of the otherwise lost time during curing of a piece or pieces, depending upon whether or not the mold is of single or multiple type. Pay is based on direct work and therefore curing time does not count. The speed at which cold presses can produce makes it necessary to have one operator at each press. If by chance the production schedule on hot work is such that an operator has only one or possibly two presses under his care, he is given other work, such as cleaning to do during the curing periods. In this way his full time is occupied and he is able to earn a full day's wages. Portable drills used for mounting are near the presses so that an operator, not otherwise fully occupied, can drill holes in hot molded parts.

Hot presses are fed by preformed briquettes or by loose material that is weighed or measured. The briquettes are made to specified volume and shape on either semi-automatic or automatic presses. Volumetric measures of loose material are made in thimbles of adjustable size. Some molds are designed with subcavities from which the material is fed to the mold cavities. The fact that the molds are hot precludes the use of measuring devices that slide or bear on the molds. To use such devices would result in partly curing the material before it was pressed into the mold. Fins are waste, so that great care is used in accurate measurement of all raw material.

As a general rule a single mold is made to prove the design before a multiple mold is made. This practice saves much wastage in mold making. The use of metal inserts is as practicable in cold molding as in hot molding.

Presses Are Safeguarded

Safety gates on these presses are designed to drop before the press stroke. The operator must employ his left hand to operate a lever to release

an interlock, and this must be held open during operation of the press valve. In this way the left hand is fully engaged during the time when there is danger of accident. Where hopper feeds are used they are designed with an arm so that the gate cannot come down until the hopper is moved back far enough to be clear of the press ram. With the interlock held open by the left hand, the right hand must be used on the valve handle, which is fitted with an extension that operates the gate during the first part of the valve handle movement. Gate frames are made of metal strips with vertical wire wickets.

Self-Priming System for Centrifugal Pumps

A SYSTEM for automatically priming centrifugal pumps and at the same time assuring the safety of the pump (as it cannot be started until fully primed and will be automatically stopped should it lose its prime at any time) has been developed by the Pennsylvania Pump & Compressor Co., Easton, Pa. A small motor-driven rotary vacuum pump unit is mounted on the centrifugal pump and arranged to evacuate the air in the pump and its suction line. It is started either by push button or remote control, as by change in the water level or head, and when the pump is fully primed, the main motor is started.

Building up of normal pressure in the discharge pipe stops the vacuum pump, but should the pump lose its prime at any time it is automatically stopped, the vacuum pump started and the cycle of priming repeated. Protective controls in the circuit serve to prevent continual repetition of the priming cycle to a point injurious to the motors.

No part of the priming system is built into the pump. It is a separate and independent unit which can be applied to any pump which is required to be automatically and efficiently primed. The safety feature particularly adapts it to installations operating on remote control.

Synthetic Resin in Rods, Sheets and Tubes

A cast synthetic resin, Catalin, is furnished in solid form, such as in rods, tubes, sheets or special castings, by the American Catalin Corp., 230 Park Avenue, New York. It requires no seasoning, it is stated, and can be machined or worked like brass or hard wood. It is recommended for numerous industrial uses including handles, levers, fittings for machinery and gages. It is made in a variety of translucent, transparent, opal, solid, mottled, or grained color effects. It is said to hold its shape and color and to have high dielectric, tensile and compressive strength.



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Steel Strip in Large Coils

Many manufacturers of steel molding and tubing have declared a preference for strip in large coils.

We are prepared to meet these requirements promptly with a product of the highest quality.

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**HOT
AND
COLD
ROLLED
STRIP**



Electric Furnace Cast Iron in the Jobbing Foundry

(Concluded from Page 702)

p. m. on Saturday. It was a rush order and a dry sand mold was required. Work was started immediately and the mold was ready at midnight. It was poured at once, and the engineers, who were waiting, left with the casting at 1 a. m. Sunday. At 8 a. m. Sunday this casting was a part of a motor on the proving grounds.

In another case, we received a pattern at 7 p. m. This was a rush order

for a local manufacturer, and work was started on the mold at once. The casting was poured at 9 p. m., and delivered, still hot, before midnight.

This quick delivery service becomes an unusually valuable asset in the case of break-downs. For example, an important casting in a badly needed machine in the shops of an automotive parts maker failed in service late on a Friday afternoon. The casting weighed 1500 lb. and could

not be welded. We received the pattern Friday night and made preparations for making the mold. The mold was ready Saturday noon and was poured immediately. After cooling sufficiently in the mold, the casting was shaken out, cleaned and delivered Saturday evening. It was machined Sunday, and the machine was back in service Monday morning.

While these examples for rapid delivery are startling, such demands are met regularly and are executed in routine manner. Castings are usually ready for delivery 12 hr. after the pattern has been received. Our customers appreciate this service in increasing numbers and require rigid adherence to specifications.

Iron and Steel Exports, Mostly Scrap, Largest Since July, 1931

WASHINGTON, April 28.—Due to the large movement of scrap, which was 57,522 gross tons, or 71.39 per cent of the month's total, exports in March, 1933, aggregating 80,567 tons, were the highest since July, 1931, when they were 84,466 tons. Compared with February, outgoing shipments in March represented a gain of 16,631

tons or 26 per cent. Compared with March of last year, the gain was 30,639 tons or 60 per cent. The daily average in March of the present year was 2599 tons against 2283 tons in February.

Imports in March totaled 22,114 tons, the highest since last December, when they were 29,390 tons. In February imports totaled 19,748 tons

and in March of last year they amounted to 41,031 tons.

Exports in the first quarter of 1933 were 70,145 tons or 53 per cent larger than those in the corresponding period of last year. The rise in scrap shipments, amounting to 430 per cent, accounted for the increase. The import movement in the first quarter of 1933, totaling 63,754 tons, was 35.5 per cent below that of the first quarter of 1932, due principally to declines in incoming shipments of pig iron, merchant steel and concrete reinforcement bars. Pig iron, however, continued to be by far the largest single item of importation, amounting to 9314 tons in March.

Of the scrap exports in March, 32,549 tons went to Japan, the leading consumer of old material shipped

Exports of Iron and Steel from the United States
(In Gross Tons)

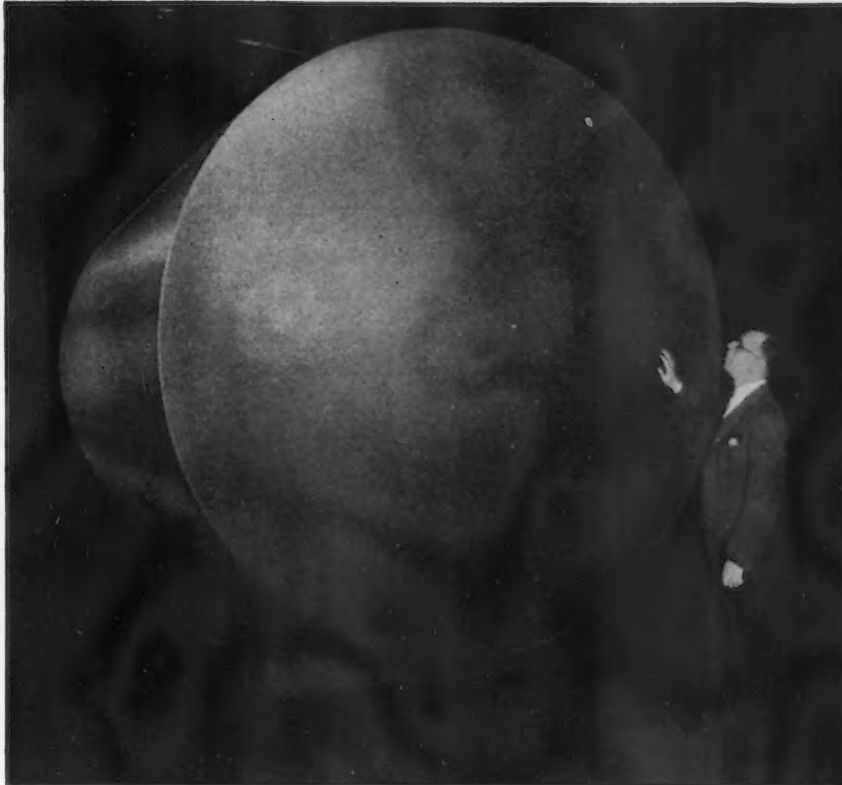
	March		Three Months Ended March	
	1933	1932	1933	1932
Pig iron.....	105	175	668	877
Ferromanganese and spiegeleisen.....	57,522	13,256	127,476	29,711
Scrap.....	57,627	13,431	128,144	30,593
Pig iron, ferroalloys and scrap.....	154	186	249	369
Ingots, blooms, billets, sheet bar.....	83	2,319	478	5,822
Skelp.....	148	2,733	2,894	6,309
Wire rods.....	385	5,238	3,621	12,500
Semi-finished steel.....	1,223	1,365	3,698	4,765
Steel bars.....	165	327	240	597
Alloy steel bars.....	49	68	93	111
Iron bars.....	298	1,854	1,657	4,554
Plates, iron and steel.....	2,563	2,512	6,554	7,632
Sheets, galvanized steel.....	33	182	102	406
Sheets, galvanized iron.....	2,277	3,135	6,795	8,926
Sheets, black steel.....	125	242	402	741
Sheets, black iron.....	1,276	2,127	3,652	6,339
Hoops, bands, strip steel.....	3,394	2,336	10,732	10,023
Tin plate; terne plate.....	472	2,000	1,609	4,173
Structural shapes, plain material.....	1,089	622	1,792	2,529
Structural material, fabricated.....	113	557	616	929
Tanks, steel.....	104	822	3,183	3,880
Steel rails.....	85	730	426	1,609
Rail fastenings, switches, frogs, etc.....	273	243	1,121	725
Boiler tubes.....	1,365	2,105	5,974	3,620
Casing and oil-line pipe.....	1,930	2,054	5,083	6,846
Pipe, black and galvanized, welded steel.....	169	305	287	560
Pipe, black and galvanized, welded iron.....	571	1,397	1,461	3,140
Plain wire.....	1,691	2,562	4,358	5,229
Barbed wire and woven wire fencing.....	73	56	141	142
Wire cloth and screening.....	233	145	424	490
Wire rope.....	482	615	1,562	2,292
Wire nails.....	247	448	854	1,005
Other nails and tacks.....	1	2	7	27
Horseshoes.....	312	266	738	764
Bolts, nuts, rivets and washers, except track..	20,613	29,077	63,561	82,036
Rolls and finished steel.....	519	375	1,348	1,297
Cast iron pipe and fittings.....	235	155	451	404
Malleable iron screwed fittings.....	250	385	1,456	865
Car wheels and axles.....	317	106	716	422
Iron castings.....	100	133	195	362
Steel castings.....	249	541	676	1,368
Forgings.....	1,670	1,700	4,842	4,718
Castings and forgings.....	272	480	855	1,231
All other.....				
Total.....	80,567	49,926	201,023	131,078

Sources of American Imports
of Iron Ore
(In Gross Tons)

	March		Three Months Ended March	
	1933	1932	1933	1932
Chile.....	22,000	21,652	22,150	110,232
Cuba.....	49	49	49	49
Spain.....	180	180	180	218
Sweden.....	16,200	8,100	23,000	33,000
French Africa.....	7,072	15,563	15,191	35,130
Canada.....				
Russia.....				
Other countries..				
Total.....	45,272	45,544	60,341	211,629

United States Imports of Pig Iron
(In Gross Tons)

	March		Three Months Ended March	
	1933	1932	1933	1932
India.....	3,949	5,651	9,628	9,808
United Kingdom.....	100	200	150	700
Germany.....	2,412	12,718	9,977	22,450
France.....	2,803	2,803	2,803	98
Netherlands.....	50	110	419	110
Sweden.....	150	150	200	200
Norway.....				
Canada.....				
Belgium.....				
All others.....				
Total.....	9,314	18,829	24,174	33,932



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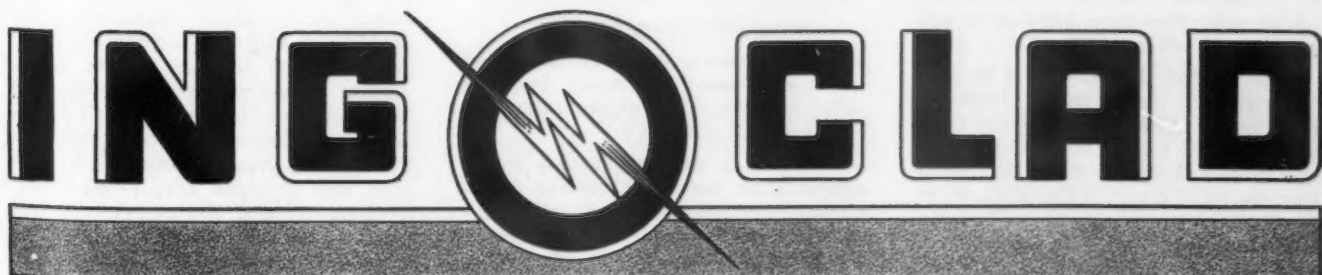
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from the United States and also the largest user of total exports in month, taking 33,761 tons. Other scrap exports were: Italy, 14,780 tons; Poland, 4326 tons; Germany, 2041 tons; India, 2000 tons, and Canada, 990 tons. The scrap movement to Italy placed that country in second position as the destination of American exports in March. Canada, heretofore the largest importer of American iron and steel, took only 5534 tons in March.

The heaviest March shipment in finished lines was in tin plate, 3394 tons, which was widely distributed. Among the consuming countries were Japan, 854 tons; China, 569 tons; Kwangtung, 349 tons; British Malaya, 301 tons; Colombia, 166 tons; Canada, 119 tons, and Mexico, 103 tons.

Supplying a total of 5111 tons, Belgium led as the source of March imports. Included in Belgian receipts were 1421 tons of structural material, 1180 tons of merchant steel bars, 979 tons of sheets and skelp and 283 tons of concrete reinforcement bars. Germany furnished 502 tons and France 217 tons of structural shapes. Of the ferromanganese and spiegeleisen imports, totaling 2071 tons, 1033 tons came from Canada, 585 tons from Norway and 361 tons from Germany. Manganese concentrates imported totaled 1619 tons, of which 1328 were credited to the United Kingdom, and 291 tons to the Dutch East Indies. India led as a source of pig iron imports, supplying 3949 tons; Sweden ranked second, furnishing 2803 tons, and the Netherlands rated third, furnishing 2412 tons.

Nickel Alloy Cast Iron Cams for Automobiles

Nickel alloy cast irons have proved eminently successful as automotive camshaft materials, according to the February issue of *Nickel Cast Iron News*, published by the International Nickel Co., Inc., 67 Wall Street, New York. T. H. Wickenden, assistant manager of the development and research department of the company, points out that by the use of approximately 3 per cent of nickel it was found possible to produce cams with a Brinell hardness in excess of 250 which were free from hard spots and machinable without difficulty.

One method, he writes, is to cast the cams in sand molds, inserting chill blocks at the points of the cams so that these points of high pressure will have a thin layer of chilled, white iron to resist wear. "The chill depth is regulated by varying the nickel and chromium content. The presence of both elements increases the hardness of the chill. The distributor gear blank, bearings and timing gear mounting, because of their slower cooling in the sand, will come out machinable, but an iron with suf-

Imports of Iron and Steel Products into the United States (In Gross Tons)

	March		Three Months Ended March	
	1933	1932	1933	1932
Pig iron.....	9,314	18,829	24,174	33,932
Sponge iron.....	.....	51	53	51
Ferromanganese and spiegeleisen*.....	2,071	1,557	6,502	5,794
Ferrochrome†.....	5	.....	5	30
Ferrosilicon‡.....	.....	.....	4	20
Other ferroalloys.....	.....	.....	1	250
Scrap.....	491	507	907	1,476
Pig iron, ferroalloys and scrap.....	11,881	20,944	31,646	41,553
Steel ingots, blooms, billets, etc.....	15	368	71	1,895
Wire rods.....	1,017	973	3,131	2,802
Semi-finished steel.....	1,032	1,341	3,202	4,697
Concrete reinforcement bars.....	303	3,189	751	8,802
Hollow steel bars.....	74	98	232	182
Merchant steel bars.....	1,506	3,529	4,982	10,541
Iron bars.....	17	41	54	158
Iron slabs.....	.....	.....	1	.....
Boiler and other plate.....	15	5	66	35
Sheets, skelp and saw plate.....	1,042	1,566	3,321	4,561
Tin plate.....	87	2,529	126	2,605
Structural shapes.....	2,168	2,538	5,438	9,236
Rails and rail fastenings.....	52	72	331	475
Welded pipe.....	435	478	1,068	1,170
Other pipe.....	127	265	265	835
Barbed wire.....	799	1,551	3,616	4,276
Round iron and steel wire.....	420	211	748	590
Flat wire and strip steel.....	71	59	196	198
Wire rope and strand.....	116	146	380	414
Other wire.....	116	23	404	180
Hoops and bands.....	1,077	1,454	4,273	5,384
Nails, tacks and staples.....	620	930	2,185	2,527
Bolts, nuts and rivets.....	11	7	52	44
Other finished steel.....	36	5	111	25
Rolled and finished steel.....	9,092	18,696	28,600	52,238
Cast iron pipe and fittings.....	10	.....	64	11
Castings and forgings.....	99	50	242	323
Total.....	22,114	41,031	63,754	98,822

*Manganese content only.

†Chromium content only.

‡Silicon content only.

ficiently low total carbon and alloy additions to give a strength of 60,000 lb. per sq. in. and a compressive strength of 150,000 lb. per sq. in. will have a hardness around 300 Brinell. A typical composition for this method of manufacture is: total carbon, 2.80 per cent; Si, 2.00; Ni, 0.75; Cr, 0.20; Mo, 0.75."

A second method described by Mr. Wickenden is to sand cast the cams using an iron with a sufficient alloy addition to develop a hardness of approximately 360 as cast. "This requires low total carbon (2.25 to 2.50 per cent), low silicon (1.00 to 1.25 per cent), 3 to 4 per cent nickel and possibly some chromium or molybdenum. These cams are annealed for machining followed by reheating and hardening to over 400 Brinell."

Reducing Cooling Costs in By-Product Coke Plant

(Concluded from Page 705)

ease of cleaning and the increased width eliminates the space between coils, into which so much water has been uselessly splashed.

The results of comparative water consumption tests for cooling wash oil indicate that the use of internally ribbed sections requires 10 to 20 per cent less water than 2-in. steel pipe coils. These tests were conducted with good average distribution of water on both types of equipment.

In the report of these tests it has

*Based on present prices.

been conservatively assumed that under these severe conditions cast iron sections will have an effective life of ten years. Cost figures based on this assumption show that over a ten-year period an internally ribbed cast iron section unit capable of cooling 100 gal. of wash oil per minute would effect a savings of about \$1,650 in replacement expenditures². In addition, the original installation of such a unit would cost about \$350 less than an equivalent steel pipe unit.

Those persons in the industry, whose duty it is not only to conserve space but also to look for possible ways of releasing already occupied space for new uses, will be especially interested in Fig. 2, which is a photograph of actual installations of wash oil cooling equipment. The bank of internally ribbed cast iron sections in the foreground has replaced the 2-in. steel pipe coils which formerly occupied that whole end of the pit. The actual ground areas taken up by these equivalent units capable of cooling approximately 100 gal. of wash oil per minute under normal temperature conditions are 292 sq. ft. for the pipe coil and 56 sq. ft. for the internally ribbed sections. The cubical spaces occupied by the pipe and sections are, respectively, 2067 cu. ft. and 359 cu. ft. In this case, therefore, cooling coil space requirements were reduced a little more than 80 per cent by using internally ribbed sections. A similar saving would be effected in the cost of construction of new cooling coil spray pits.